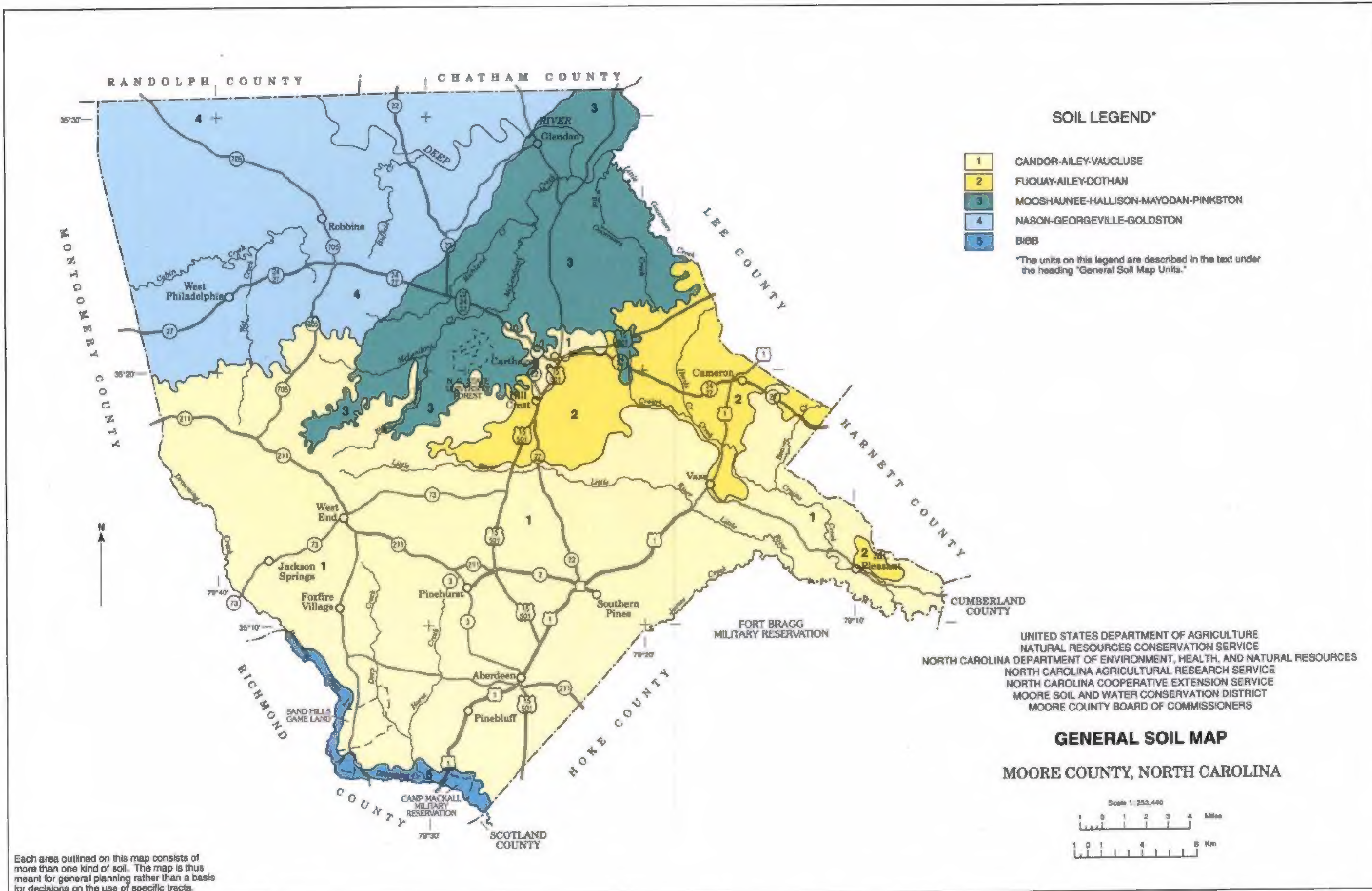
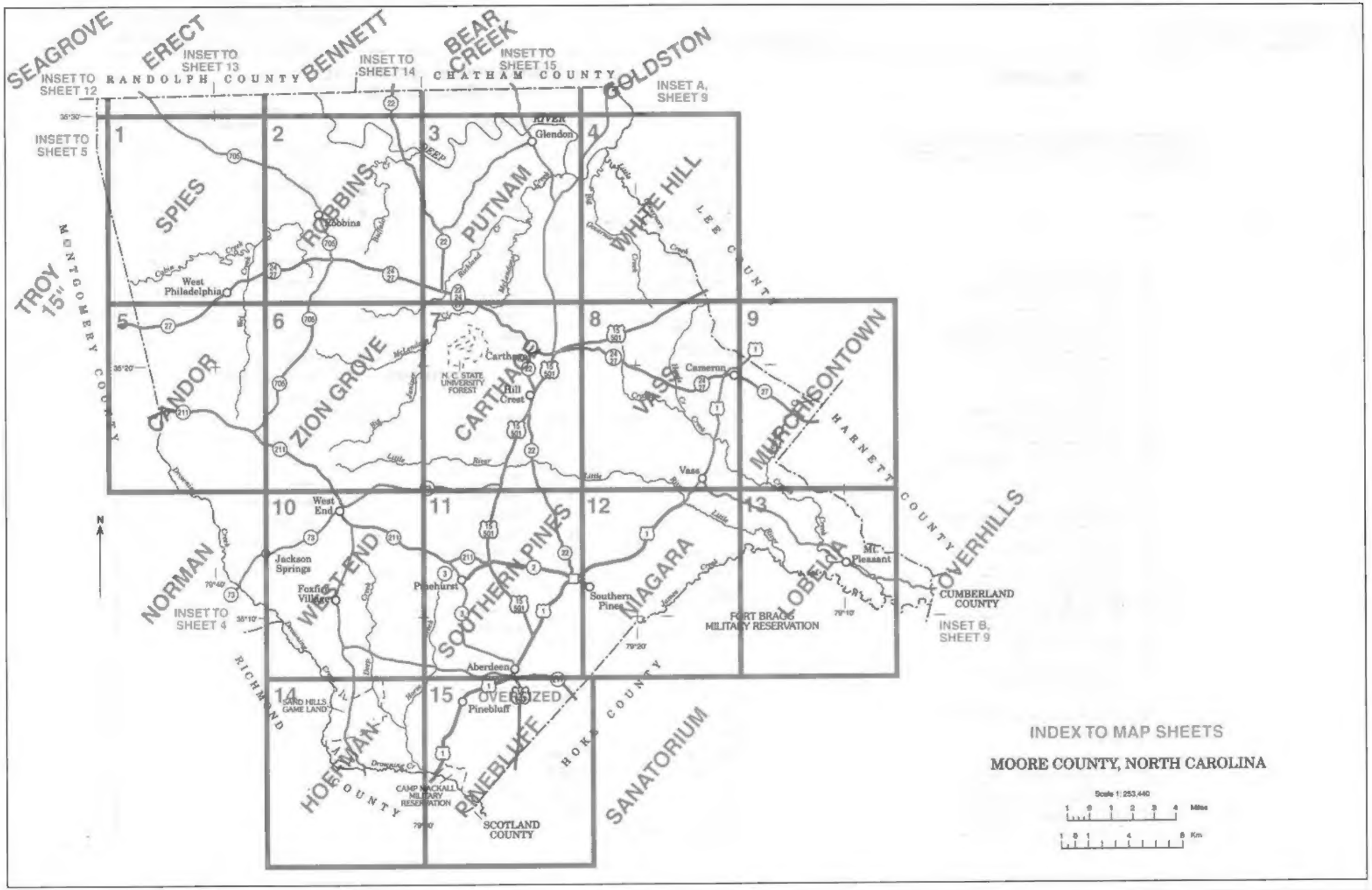

SOIL LEGEND*
1 CANDOR-AILEY-VAUCLUSE
2 FUQUAY-AILEY-DOTHAN
3 MOOSHAUNEE-HALLISON-MAYODAN-PINKSTON
4 NASON-GEORGEVILLE-GOLDSTON
5 BIBB
*The units on this legend are described in the text under the heading "General Soil Map Units."
UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
NORTH CAROLINA DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES
NORTH CAROLINA AGRICULTURAL RESEARCH SERVICE
NORTH CAROLINA COOPERATIVE EXTENSION SERVICE
MOORE SOIL AND WATER CONSERVATION DISTRICT
MOORE COUNTY BOARD OF COMMISSIONERS
GENERAL SOIL MAP
MOORE COUNTY, NORTH CAROLINA
Scale 1: 253,440
Miles
Km
RANDOLPH COUNTY
CHATHAM COUNTY
MONTGOMERY COUNTY
LEE COUNTY
HARNETT COUNTY
CUMBERLAND COUNTY
HOKE COUNTY
RICHMOND COUNTY
SCOTLAND COUNTY
FORT BRAGG MILITARY RESERVATION
SAND HILLS GAME LAND
CAMP MACKALL MILITARY RESERVATION
DEEP RIVER
Glendon
Robbins
West Philadelphia
Carthage
Cameron
Vass
West End
Jackson Springs
Foxfire Village
Pinehurst
Southern Pines
Aberdeen
Pinebluff
Mt Pleasant
N
Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.


SEAGROVE
ERECT
BENNETT
BEAR CREEK
GOLDSTON
INSET TO SHEET 12
INSET TO SHEET 13
INSET TO SHEET 14
INSET TO SHEET 15
INSET A, SHEET 9
RANDOLPH COUNTY
CHATHAM COUNTY
INSET TO SHEET 5
TROY 15"
MONTGOMERY COUNTY
SPIES
ROBBINS
PUTNAM
WHITE HILL
LEE COUNTY
Glendon
Robbins
West Philadelphia
CANDOR
ZION GROVE
CARTHAGE
VASS
MURPHY
HARNETT COUNTY
Carthage
N. C. STATE UNIVERSITY FOREST
Hill Crest
Cameron
Vass
NORMAN
WEST END
SOUTHERN PINES
NIAGARA
LOBELIA
OVERHILLS
West End
Jackson Springs
Foxfire Village
Pinehurst
Southern Pines
Mt. Pleasant
CUMBERLAND COUNTY
INSET TO SHEET 4
FORT BRAGG MILITARY RESERVATION
INSET B, SHEET 9
RICHMOND COUNTY
Aberdeen
OVERHILLED
Pinebluff
SAND HILLS GAME LAND
HOKE COUNTY
HOFFMAN
PINEBLUFF
SANATORIUM
CAMP MACKALL MILITARY RESERVATION
SCOTLAND COUNTY
N
INDEX TO MAP SHEETS
MOORE COUNTY, NORTH CAROLINA
Scale 1:253,440
Miles
Km

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MOORE COUNTY, NORTH CAROLINA

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES
NORTH CAROLINA AGRICULTURAL RESEARCH SERVICE
NORTH CAROLINA COOPERATIVE EXTENSION SERVICE
MOORE COUNTY SOIL AND WATER CONSERVATION DISTRICT
MOORE COUNTY BOARD OF COMMISSIONERS

SOIL LEGEND

Soil map symbols and map unit names are alphabetical. Map symbols are letters. The first letter, always a capital, is the initial letter of the soils series name or miscellaneous area. The second letter is a small letter. The third letter, if used is always a capital letter and class of slope or land form. Symbols with only two letters indicates nearly level soils, miscellaneous areas, or soils mapped and classified above the series level.

SYMBOL	NAME
AeB	Ailey loamy sand, 2 to 8 percent slopes
AeD	Ailey loamy sand, 8 to 15 percent slopes
Bb	Bibb loam, 0 to 2 percent slopes, frequently flooded
CaB	Candor sand, 0 to 4 percent slopes
CaC	Candor sand, 4 to 12 percent slopes
CbC	Candor-Urban land complex, 2 to 12 percent slopes
Ch	Chewacla silt loam, 0 to 2 percent slopes, frequently flooded
Co	Congaree loam, 0 to 2 percent slopes, frequently flooded
CrB	Creedmoor fine sandy loam, 2 to 6 percent slopes
CrC	Creedmoor fine sandy loam, 6 to 10 percent slopes
DoA	Dothan loamy sand, 0 to 2 percent slopes
DoB	Dothan loamy sand, 2 to 6 percent slopes
FaB	Fuquay loamy sand, 0 to 6 percent slopes
FuB	Fuquay-Urban land complex, 0 to 6 percent slopes
GeB	Georgeville gravelly silt loam, 2 to 8 percent slopes
GeD	Georgeville gravelly silt loam, 8 to 15 percent slopes
GlaB	Gilead loamy sand, 2 to 8 percent slopes
GlaD	Gilead loamy sand, 8 to 15 percent slopes
GoC	Goldston very channery silt loam, 2 to 15 percent slopes
GoE	Goldston very channery silt loam, 15 to 45 percent slopes
IrB	Iredell clay loam, 2 to 6 percent slopes
JoA	Johns fine sandy loam, 0 to 2 percent slopes
KsA	Kalmia sandy loam, wet substratum, 0 to 2 percent slopes
KvB	Kenansville loamy sand, 0 to 4 percent slopes
LgB	Lignum silt loam, 2 to 7 percent slopes
LgC	Lignum silt loam, 7 to 12 percent slopes
MaB	Masada fine sandy loam, 2 to 8 percent slopes
MaD	Masada fine sandy loam, 8 to 15 percent slopes
MdB	Mayodan fine sandy loam, 2 to 8 percent slopes
MdD	Mayodan fine sandy loam, 8 to 15 percent slopes
MdE	Mayodan fine sandy loam, 15 to 25 percent slopes
MoB	Mooshaunee-Hallison complex, 2 to 8 percent slopes
MoD	Mooshaunee-Hallison complex, 8 to 15 percent slopes
MoE	Mooshaunee-Hallison complex, 15 to 25 percent slopes
NaB	Nason silt loam, 2 to 6 percent slopes
NaD	Nason silt loam, 6 to 15 percent slopes
PaA	Pactolus sand, 0 to 3 percent slopes
PkD	Pinkston silt loam, 8 to 15 percent slopes
PkF	Pinkston silt loam, 15 to 40 percent slopes
Pt	Pits, quarry
TnE	Tatum and Nason channery silt loams, 15 to 25 percent slopes
TpA	Tetotum silt loam, 0 to 3 percent slopes, rarely flooded
Ud	Udorthents, loamy
Ur	Urban land
VaB	Vaucluse loamy sand, 2 to 8 percent slopes
VaD	Vaucluse loamy sand, 8 to 15 percent slopes
VaE	Vaucluse loamy sand, 15 to 25 percent slopes
VcB	Vaucluse gravelly sandy loam, 2 to 8 percent slopes
VcD	Vaucluse gravelly sandy loam, 8 to 15 percent slopes
VcE	Vaucluse gravelly sandy loam, 15 to 25 percent slopes
VuB	Vaucluse-Urban land complex, 2 to 8 percent slopes
VuD	Vaucluse-Urban land complex, 8 to 15 percent slopes
We	Wehadkee loam, 0 to 2 percent slopes, frequently flooded

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES
- National, state, or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline and neatline
- AD HOC BOUNDARY (label)
- Small airport, airfield, park, oilfield, cemetery, or flood pool

STATE COORDINATE TICK
1 650 000 FEET

LAND DIVISION CORNER
(sections and land grants)

ROADS
- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS
- Interstate
- Federal
- State
- County, farm or ranch

RAILROAD

POWER TRANSMISSION LINE
(normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES
- Without road
- With road
- With railroad

DAMS
- Large (to scale)
- Medium or Small

PITS
- Gravel pit
- Mine or quarry. Borrow areas < 3 acres

MISCELLANEOUS CULTURAL FEATURES
- Farmstead, house (omit in urban area)
- Church
- School
- Indian mound (label)
- Located object (label)
- Farm (label)
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE
- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label)
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS
- Perennial
- Intermittent

MISCELLANEOUS WATER FEATURES
- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS

ESCARPMENTS
- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK

SOIL SAMPLE (normally not shown)

MISCELLANEOUS
- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (eodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

5 000 4 000 3 000 2 000 1 000 0 5 000 10 000 Feet
1 .5 0 1 2 3 Kilometers
Scale - 1:24000

MOORE COUNTY, NORTH CAROLINA NO. 1

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

5000 4000 3000 2000 1000 0 5000 10000 Feet
1 .5 0 1 2 3 Kilometers
Scale - 1:24000

MOORE COUNTY, NORTH CAROLINA NO. 2

N

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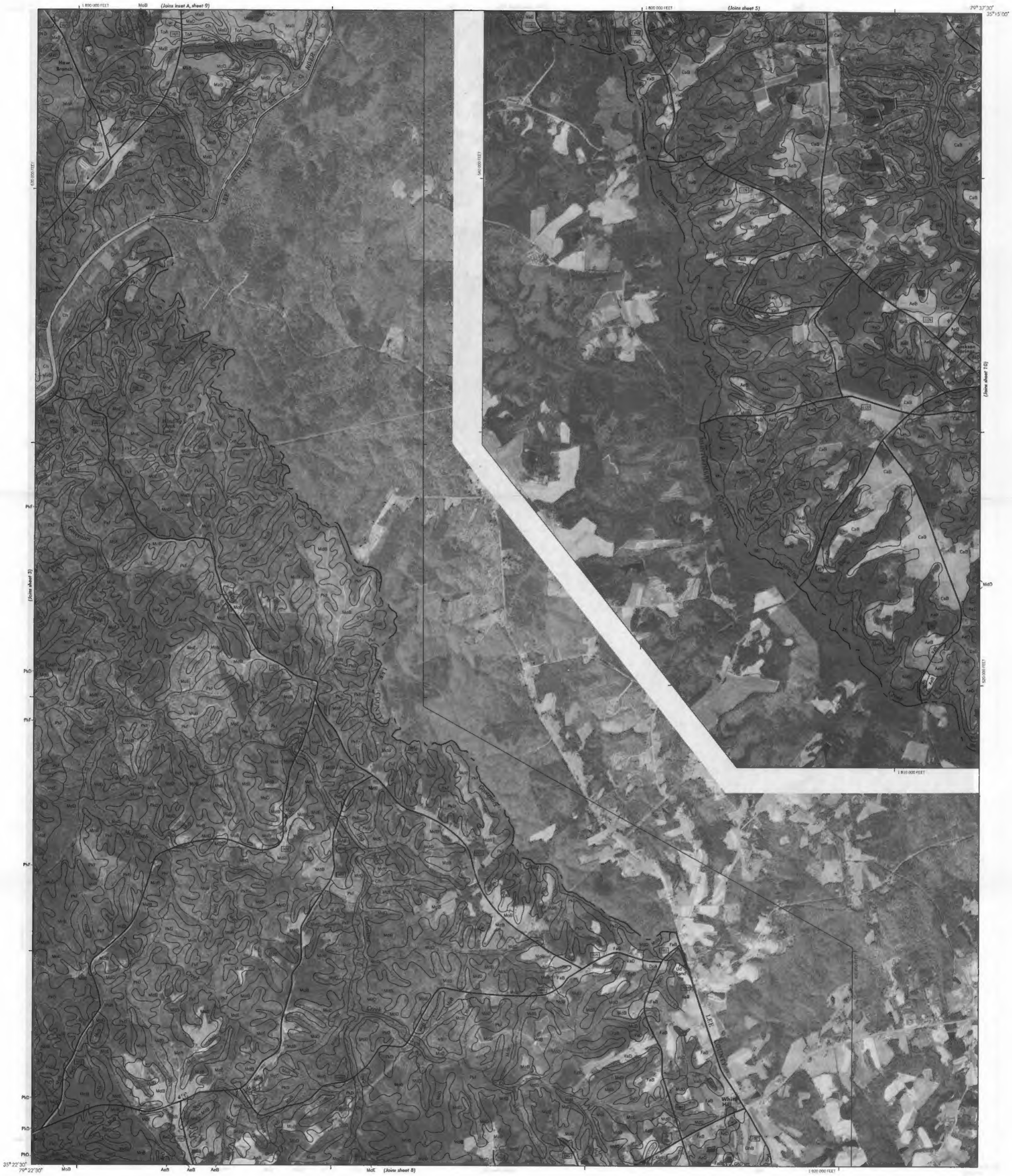
5000 4000 3000 2000 1000 0 5000 10000 Feet
1 .5 0 1 2 3 Kilometers
Scale - 1:24000

MOORE COUNTY, NORTH CAROLINA NO. 3

N

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SHEET NO. 4
SOIL SURVEY OF MOORE COUNTY, NORTH CAROLINA



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

5000 4000 3000 2000 1000 0 5000 10000 Feet
1 .5 0 1 2 3 Kilometers
Scale - 1:24000

MOORE COUNTY, NORTH CAROLINA NO. 4

N

SHEET NO. 4 OF 15

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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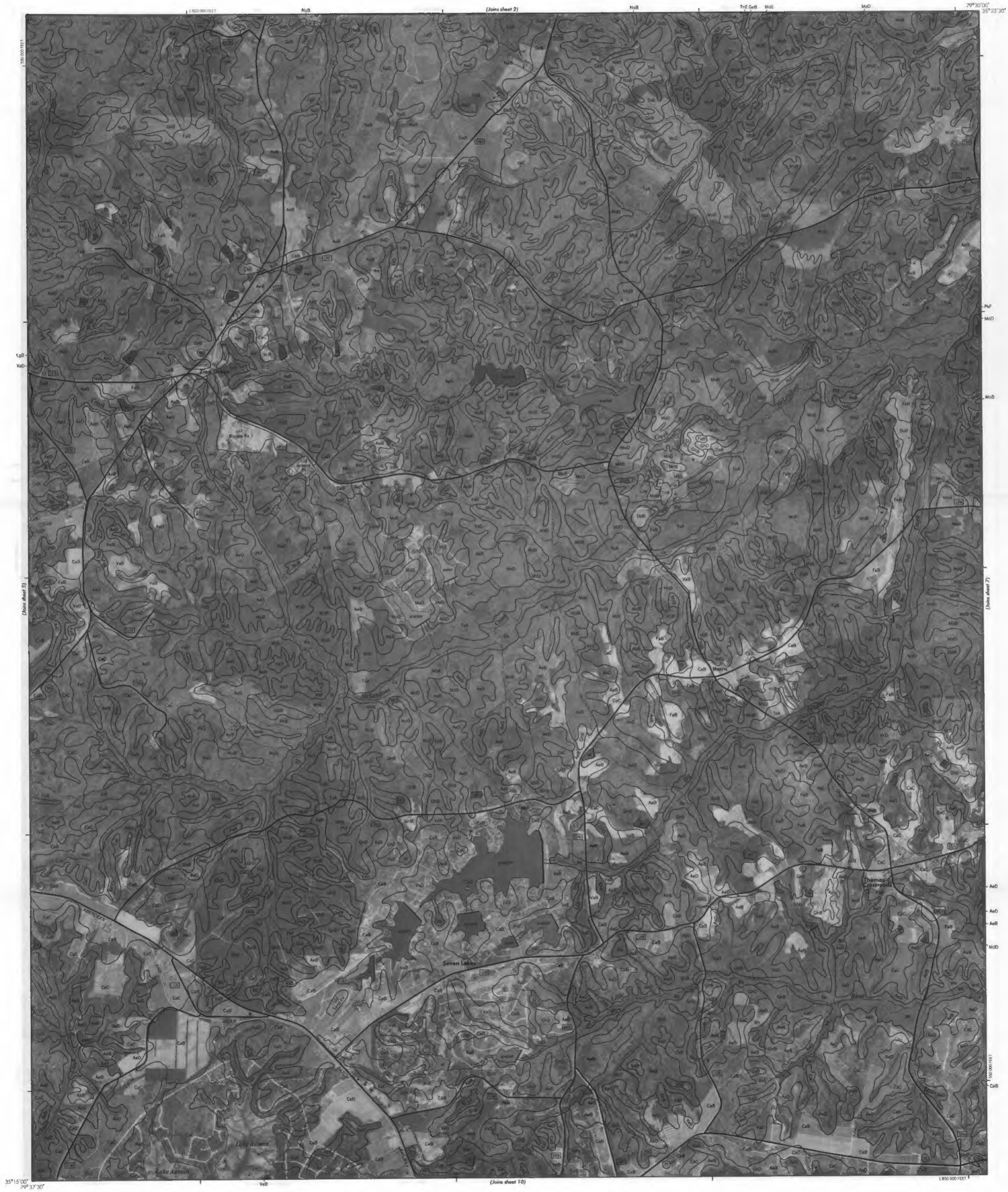
1 .5 0 1 2 3 Kilometers
Scale - 1:24000

MOORE COUNTY, NORTH CAROLINA NO. 5

N



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

5000 4000 3000 2000 1000 0 5000 10,000 Feet
1 .5 0 1 2 3 Kilometers
Scale - 1:24 000

MOORE COUNTY, NORTH CAROLINA NO. 6

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1980 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

5000 4000 3000 2000 1000 0 5000 10000 Feet
1 .5 0 1 2 3 Kilometers
Scale - 1:24000

MOORE COUNTY, NORTH CAROLINA NO. 7

N

This soil survey map was compiled by the U S Department of Agriculture Soil Conservation Service and cooperating agencies Base maps are orthophotographs prepared by the U S Department of the Interior Geological Survey from 1980 aerial photography Coordinate grid ticks and land division corners, if shown, are approximately positioned

5000 4000 3000 2000 1000 0 5000 10000 Feet
1 5 0 1 2 3 Kilometers
Scale 1 24000

MOORE COUNTY, NORTH CAROLINA NO. 8

N

This soil survey map was compiled by the U S Department of Agriculture Soil Conservation Service and cooperating agencies Base maps are orthophotographs prepared by the U S Department of the Interior, Geological Survey from 1980 aerial photography Coordinate grid ticks and land division corners, if shown are approximately positioned

MOORE COUNTY, NORTH CAROLINA NO. 9

This soil survey map was compiled by the U S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U S. Department of the Interior Geological Survey from 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

5000 4000 3000 2000 1000 0 5000 10000 Feet
1 5 0 1 2 3 Kilometers
Scale - 1:24000

MOORE COUNTY, NORTH CAROLINA NO. 10

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1981 aerial photography Coordinate grid ticks and land division corners, if shown are approximately positioned

5000 4000 3000 2000 1000 0 5000 10000 Feet
1 5 0 1 2 3 Kilometers
Scale 1 24000

MOORE COUNTY, NORTH CAROLINA NO. 11

N

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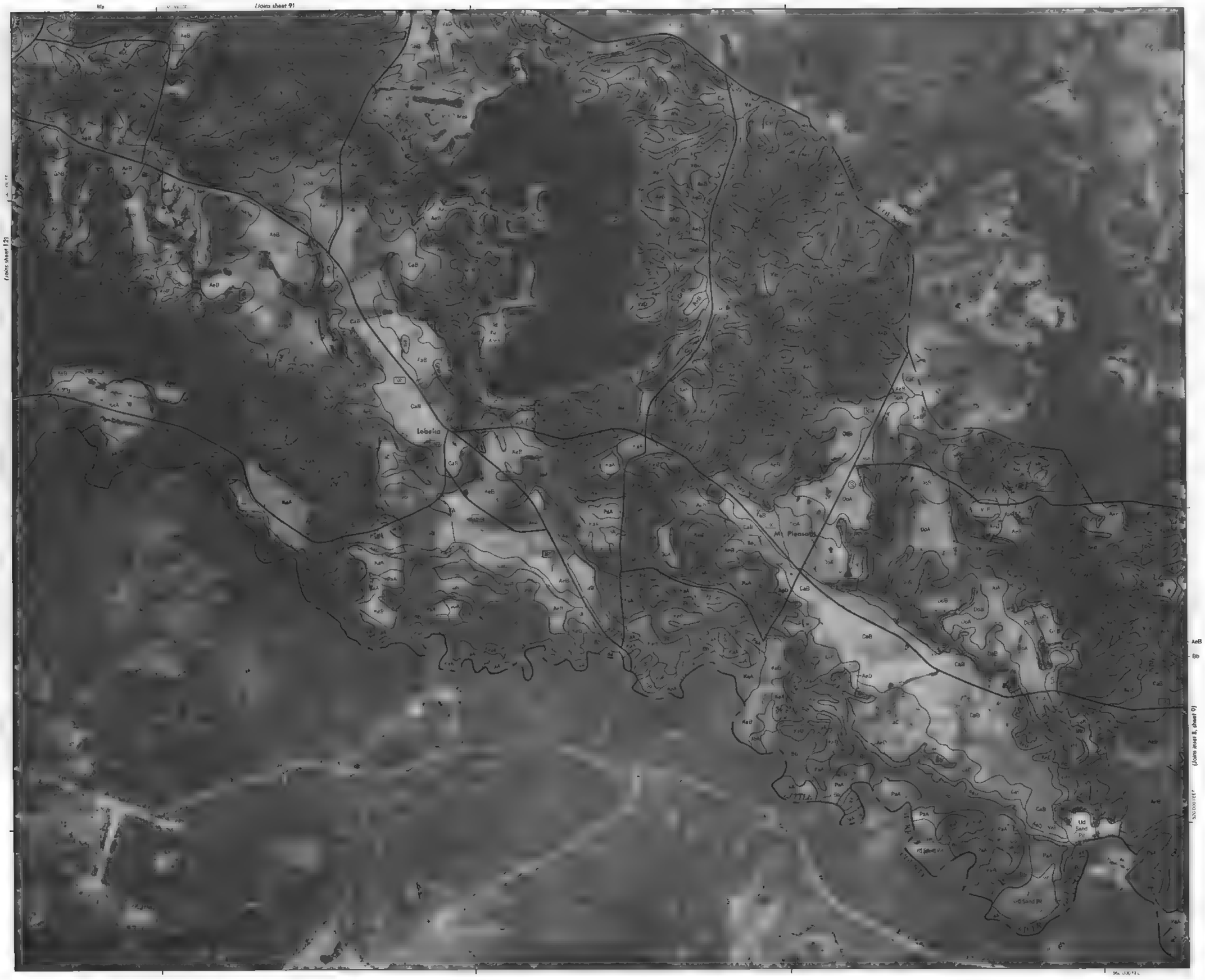
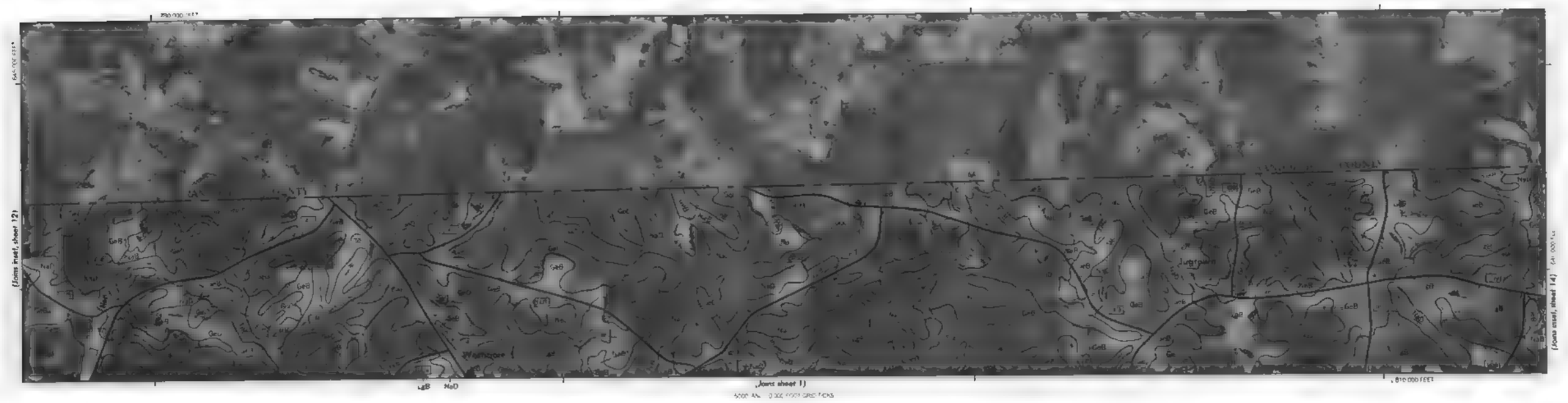
5000 4000 3000 2000 1000 0 5000 10000 Feet
1 0 1 2 3 Kilometers
Scale - 1 24000

MOORE COUNTY, NORTH CAROLINA NO. 12

N





This soil survey map was compiled by the U S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U. S. Department of the Interior, Geological Survey, from 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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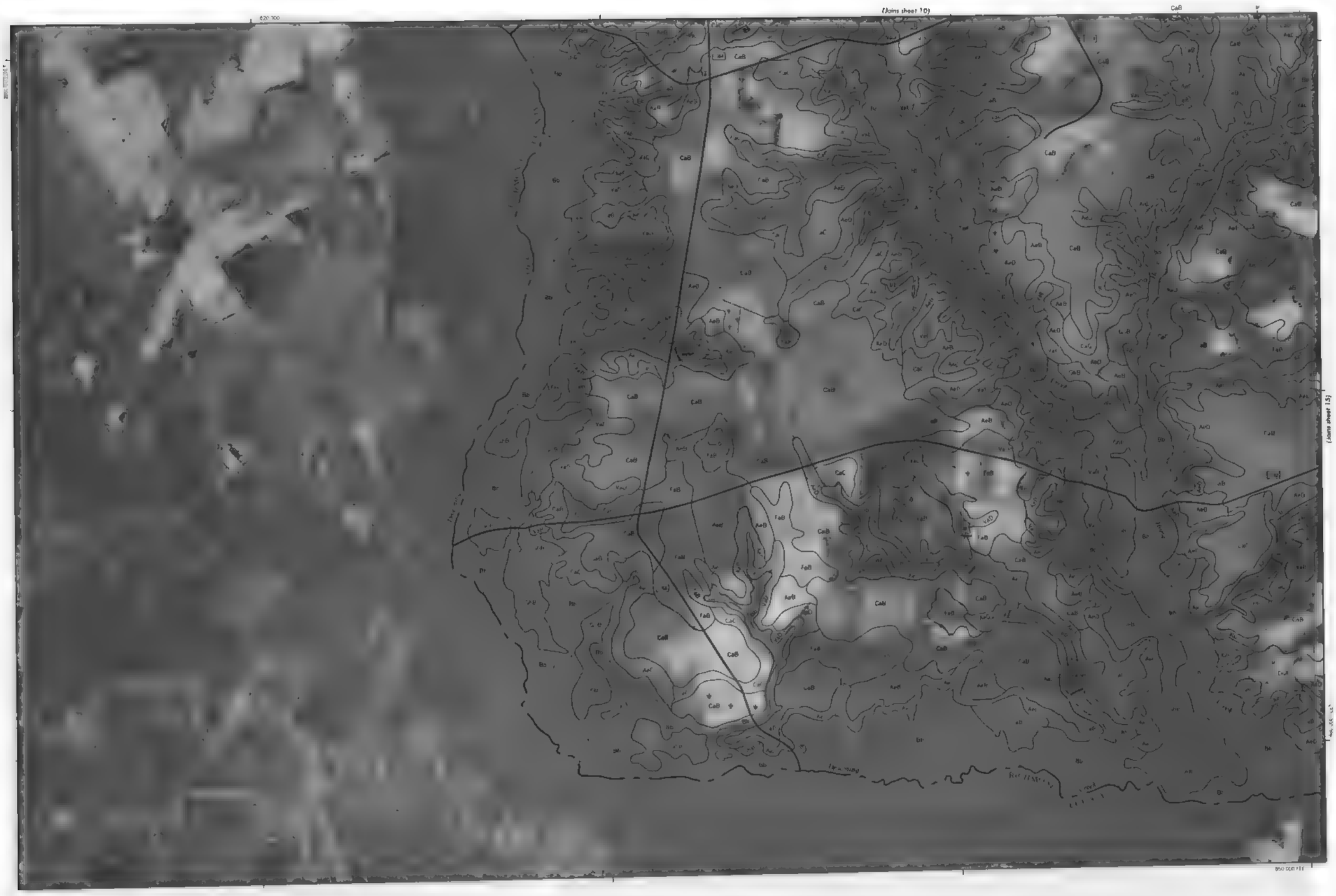
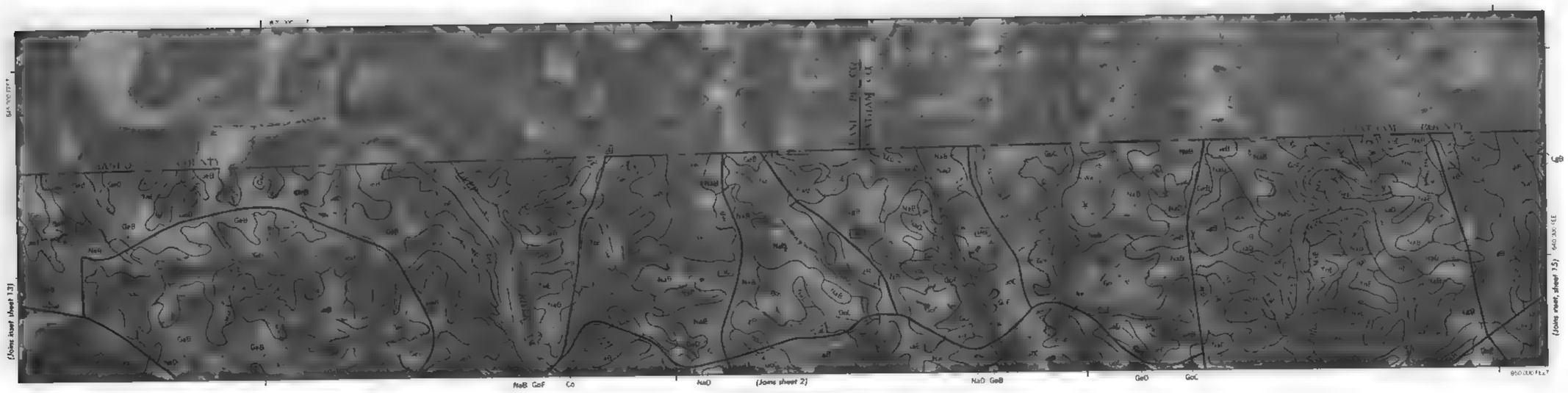
1 0 1 2 3 Kilometers
Scale - 1 24000

MOORE COUNTY, NORTH CAROLINA NO. 13

N





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5000 4000 3000 2000 1000 0 5000 10000 Feet

5 0 1 2 3 Kilometers

Scale 1:24000

MOORE COUNTY, NORTH CAROLINA NO. 14

N

This soil survey map was compiled by the U S Department of Agriculture So Conservat on Serv ce and cooperat ng agencies Base maps are orthophotographs prepared by the U S Depart ment of the Interior Geological Survey, from 1981 aerial photography Coordinate grid ticks and land division corners, if shown are approximately positioned

5000 4000 3000 2000 1000 0 5000 10000 Feet
1 5 0 1 2 3 Kilometers
Scale 1 24000

MOORE COUNTY, NORTH CAROLINA NO. 15

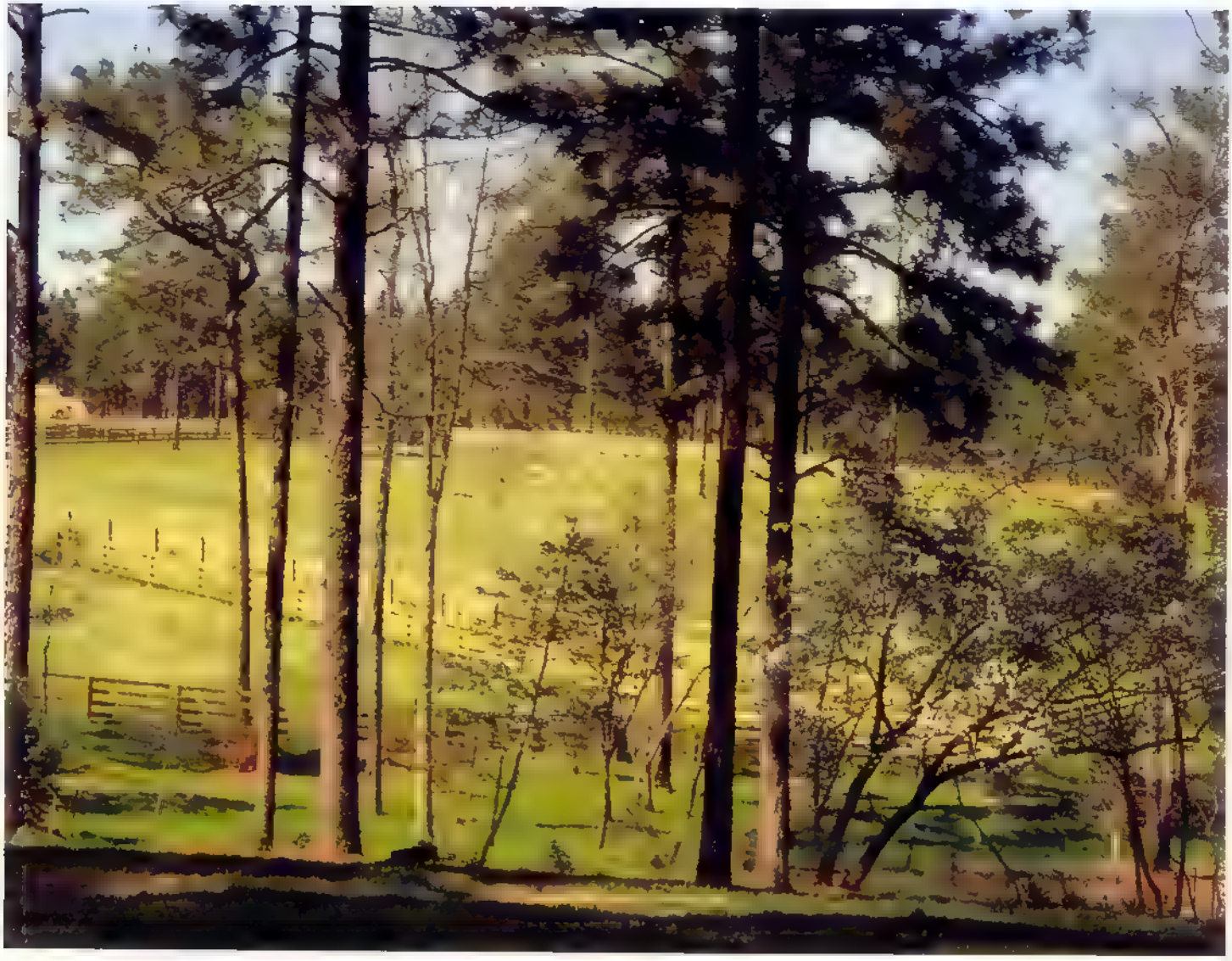
N

United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with North Carolina Department of Environment, Health, and Natural Resources; North Carolina Agricultural Research Service; North Carolina Cooperative Extension Service; Moore Soil and Water Conservation District; and Moore County Board of Commissioners

Soil Survey of Moore County, North Carolina



How To Use This Soil Survey

General Soil Map

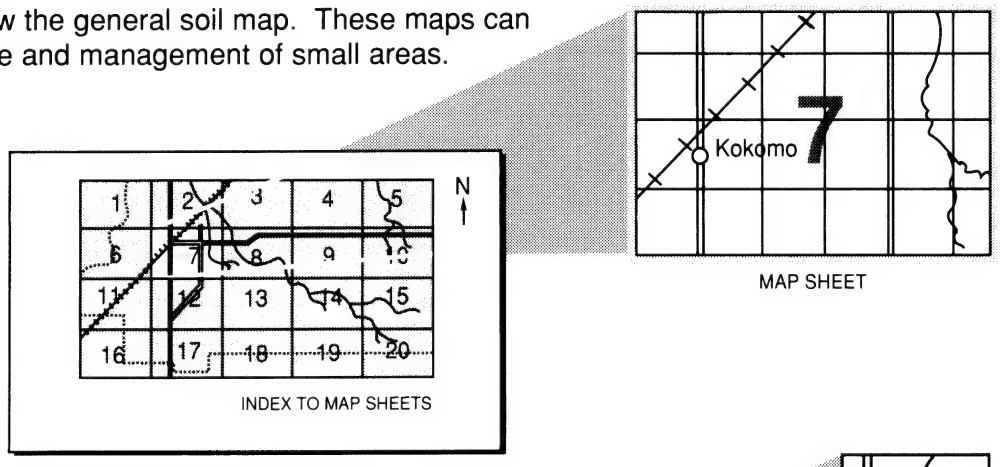
The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

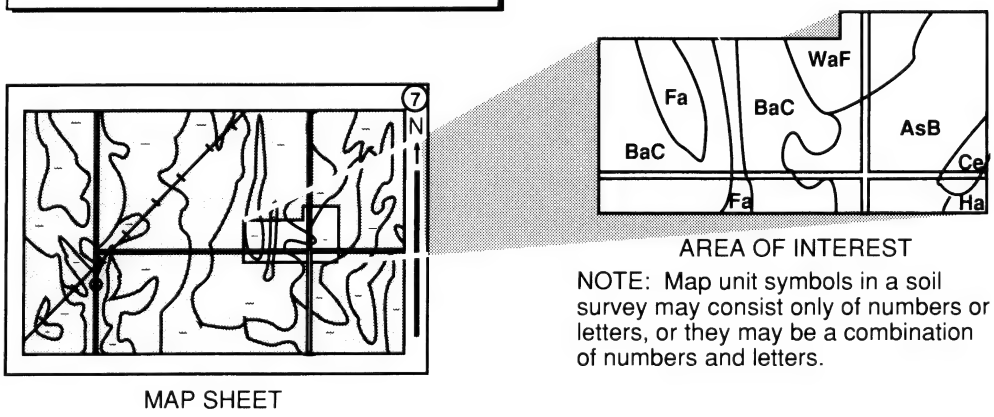
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.



Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the North Carolina Agricultural Research Service, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1986. Soil names and descriptions were approved in 1986. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1986. This soil survey was made cooperatively by the Natural Resources Conservation Service; North Carolina Department of Environment, Health, and Natural Resources; North Carolina Agricultural Research Service; North Carolina Cooperative Extension Service; Moore Soil and Water Conservation District; and Moore County Board of Commissioners. It is part of the technical assistance furnished to the Moore Soil and Water Conservation District. The Moore County Board of Commissioners provided financial assistance for the survey.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

The first soil survey of Moore County was published in 1922 by the U.S. Department of Agriculture. This survey updates the first survey, provides more detailed maps on aerial photographs, and contains more interpretive information *(9)*.

All programs and services of the Natural Resources Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, marital status, age, or handicap.

Cover: An area of Ailey loamy sand, 2 to 8 percent slopes, used for hybrid bermudagrass hay and pasture.

Contents

Issued December 1995

Index to Map Units

Summary of Tables

Foreword

This soil survey contains information that can be used in land-planning programs in Moore County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the North Carolina Cooperative Extension Service.

Richard A. Gallo
State Conservationist
Natural Resources Conservation Service

Soil Survey of Moore County, North Carolina

By Perry W. Wyatt, North Carolina Department of Environment, Health, and Natural Resources

Soils surveyed by Perry W. Wyatt, North Carolina Department of Environment, Health, and Natural Resources; and Brian A. Wood, W. Allen Hayes, Jerry V. Stimpson, and Johnson C. Jenkins, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
North Carolina Department of Environment, Health, and Natural Resources; North Carolina Agricultural Research Service; North Carolina Cooperative Extension Service; Moore County Board of Commissioners; and Moore Soil and Water Conservation District

Moore County is near the geographic center of North Carolina (fig. 1). In 1990, the population of the county was 59,013 *(17)*. It has a total of 451,552 acres, or 705 square miles. It is bordered by Chatham and Randolph Counties to the north; Lee, Harnett, Hoke, and Cumberland Counties to the east; Richmond County to the south; and Richmond and Montgomery Counties to the west.

The county seat is Carthage, which is near the center of the county. Southern Pines, the largest city in the county, is along U.S. Highway 1 in the southeastern part of the county. Other towns are Robbins in the northern part; Whispering Pines and Vass in the eastern part; Pinehurst, Aberdeen, and Pinebluff in the southern part; and Jackson Springs in the southwestern part.

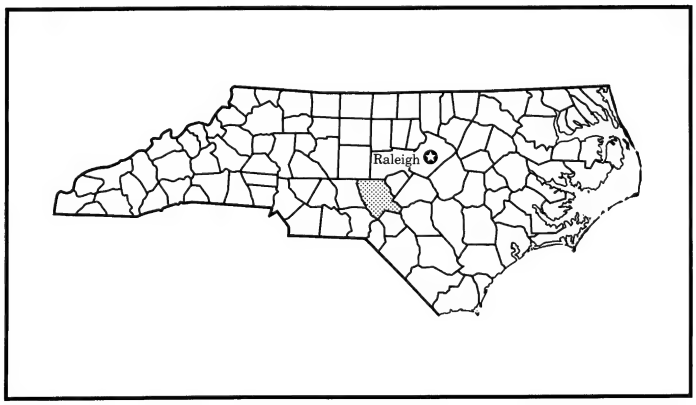


Figure 1.—Location of Moore County in North Carolina.

General Nature of the County

This section gives general information about Moore County. It describes history and economic development; physiography, relief, and drainage; and climate.

History and Economic Development

The original inhabitants of Moore County were Scottish settlers who migrated up the Cape Fear River from Wilmington to what is now Cumberland and Moore Counties in about 1739. In 1784, Moore County was formed from what was then a part of Cumberland County *(9)*.

Agriculture has played a major role in the economic development of the county. In the early 19th century, tobacco and corn were the main agricultural crops and provided a base for the economy. They still are important crops, but poultry, soybeans, small grains, and livestock are increasing in acreage as farming becomes more diversified.

Figure 2.—A golf course in Moore County.

The Sandhills or Coastal Plain area is in the southern part of the county. A cluster of large communities, such as Aberdeen, Southern Pines, and Pinehurst, and smaller communities, such as Pinebluff, were established in this area in the late 1800's. Today, Aberdeen is the commercial and industrial center of the area, while Southern Pines is a residential and resort center as well as a commercial center. Pinehurst, Whispering Pines, Foxfire, and Seven Lakes are other residential and resort communities. Some of the world's finest facilities for golfing are in this area (fig. 2).

The Piedmont area is in the northern part of the county. Several small towns and communities are in this area, with Robbins and Highfalls being the largest. Although several textile and manufacturing plants are in the area, forestry and agriculture are major sources of income. Poultry and livestock are the major agricultural sources of income.

Physiography, Relief, and Drainage

Moore County is in an area along the boundary between two major physiographic regions in the State The northern part of the county is in the Piedmont region, and the southern part is in the Upper Coastal Plain region. The soils of the Piedmont region are underlain by bedrock consisting of slate and sedimentary rock. The soils of the Coastal Plain are

underlain by unconsolidated sandy to clayey sediments.

The topographic features in the county vary according to the physiographic region. The higher elevations and the steeper slopes between valleys and ridges are in the central and northwestern parts of the county. Elevations range from 720 feet above sea level near Samarcand to 230 feet in the eastern part of the county. The elevation of Carthage, the county seat, is 575 feet above sea level.

The county is divided into three drainage basins—northern, central, and southern. The northern basin is drained by the Deep River and its tributaries; Big Governors, Little Governors, Crawley, McLendons, Buffalo, Cabin, Wet, and Bear Creeks. The central basin is drained by the Little River and its tributaries. The southern basin is drained by Drowning Creek.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Pinehurst, North Carolina, in the period 1958 to 1978. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 43 degrees F and the average daily minimum temperature is 32 degrees. The lowest temperature on record, which occurred at Pinehurst on December 13, 1962, is 3 degrees. In summer the average temperature is 78 degrees and the average daily maximum temperature is 89 degrees. The highest recorded temperature, which occurred at Pinehurst on June 27, 1954, is 106 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 49.36 inches. Of this, 27 inches, or 55 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 22 inches. The heaviest 1-day rainfall during the period of record was 7.11 inches at Pinehurst on October 15, 1954. Thunderstorms occur on about 45 days each year, and most occur in summer.

The average seasonal snowfall is 5 inches. The greatest snow depth at any one time during the period of record was 15 inches. On an average of 1 day, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 60 percent of the time possible in summer and 55 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 9 miles per hour, in spring.

How This Survey Was Made

This survey was made to provide information about the soils in Moore County. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They studied many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the unconsolidated material from which the soil formed.

Soils occur in an orderly pattern that results from the combined influence over time of climate, parent material, relief, and plants and animals. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils and relating their position to specific segments of the landscape, soil scientists develop a concept, or model, of how the soils were formed. This model enables the soil scientists to predict with a considerable degree of accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify the soils. After describing the soils and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are

concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area are generally collected for laboratory analyses and for engineering tests. The data from these analyses and tests and from field-observed characteristics and soil properties are used to predict behavior of the soils under different uses. Interpretations are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a relatively high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will be at a specific level in the soil on a specific date.

Soil boundaries are drawn on aerial photographs and each delineation is identified as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in accurately locating boundaries.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by two or three kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. In the detailed soil map units, these latter soils are called inclusions or included soils. In the general soil map units, they are called minor soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are identified in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soils on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or a building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

1. Candor-Ailey-Vaucluse

Nearly level to moderately steep, deep, somewhat excessively drained and well drained soils that are sandy throughout or having a loamy subsoil that is brittle; on uplands

This map unit is in the southern part of the county. Broad ridges a mile or more wide in some areas are separated by moderately steep side slopes. Slopes range from 0 to 25 percent. Short drainageways join to form rivers and streams that flow sluggishly through flood plains. The natural vegetation is mainly longleaf pine, turkey oak, and blackjack oak.

About 35 percent of the acreage in this map unit has been cleared of trees. Most of the cleared areas are used for tobacco, corn, soybeans, pasture, or a small acreage of peaches.

This map unit makes up about 50 percent of the county. It is about 35 percent Candor soils, 20 percent Ailey soils, 15 percent Vaucluse soils, and 30 percent minor soils. The minor soils are Gilead, Fuquay, Dothan, Mayodan, and Pinkston soils in the uplands and Bibb, Wehadkee, Kenansville, Kalmia, and Pactolus soils on flood plains and terraces.

The nearly level to strongly sloping, somewhat excessively drained Candor soils are on broad ridges. The surface layer is grayish brown sand. The subsurface layer is light yellowish brown sand. The subsoil is yellowish brown loamy sand that has mottles in shades of brown and yellow.

The gently sloping to strongly sloping, well drained Ailey soils are on ridgetops and side slopes. The surface layer is dark gray loamy sand. The subsurface layer is brownish yellow sand. The subsoil is sandy clay loam that has mottles in shades of red, brown, and yellow. It is brownish yellow in the upper part and reddish yellow and brittle in the lower part.

The gently sloping to moderately steep, well drained Vaucluse soils are on the shoulders of ridges and side slopes. The surface layer is brown loamy sand. The subsurface layer is yellowish brown loamy sand. The subsoil is sandy clay loam that has yellowish red mottles. The upper part is strong brown, and the lower part is reddish yellow.

The major soils have limitations affecting agricultural production. The major limitations in the Candor and Ailey soils are droughtiness, the leaching of plant nutrients, and wind and water erosion. The major hazard in the Vaucluse soils is erosion. Ponds provide water for irrigating crops and watering livestock. In some areas sealing the ponds is necessary because of the rapidly permeable soil layers. In some areas the major soils are used for hay and pasture. Droughtiness is the major limitation.

A major part of this map unit is used as woodland. Longleaf pine is the dominant tree species. The production of pine straw is an important industry on this map unit. Turkey oak and blackjack oak are the predominant hardwood species. Droughtiness is the major limitation in the Candor and Ailey soils. The Ailey and Vaucluse soils are susceptible to windthrow because of the dense, brittle subsoil.

Urban development is common in the central part of this map unit. In areas of the Candor soils, onsite sewage disposal is limited by rapid permeability. In areas of the Ailey soils, it is limited by moderately slow permeability, and in areas of the Vaucluse soils, it is limited by slow permeability.

2. Fuquay-Ailey-Dothan

Nearly level to strongly sloping, deep, well drained soils having a loamy subsoil that is brittle in the lower part; on uplands

This map unit is in the eastern part of the county, along the Moore-Lee County line. Broad ridges are separated by strongly sloping side slopes. Slopes range from 0 to 15 percent. Short drainageways join to form streams that flow sluggishly through the narrow flood plains. The natural vegetation is mixed pine and hardwoods.

About 50 percent of the acreage in this map unit has been cleared of trees. Most of the cleared areas are used for tobacco, corn, soybeans, small grain, or horticultural crops.

This map unit makes up about 8 percent of the county. It is about 41 percent Fuquay soils, 21 percent Ailey soils, 7 percent Dothan soils, and 31 percent minor soils. The minor soils are Candor and Vaucluse soils along the western boundary of the map unit; Georgeville, Nason, and Gilead soils on side slopes along the major streams; and Bibb, Chewacla, and Tetotum soils on flood plains and terraces.

The nearly level and gently sloping Fuquay soils are on broad ridgetops. The surface layer is brown loamy sand, and the subsurface layer is very pale brown loamy sand. The subsoil is sandy clay loam. The upper part is brownish yellow, the next part is brownish yellow and has mottles in shades of brown, red, and gray, and the lower part is mottled in shades of brown, red, yellow, and gray.

The gently sloping to strongly sloping Ailey soils are on the shoulders of ridges and side slopes. The surface layer is brown loamy sand, and the subsurface layer is brownish yellow sand. The subsoil is sandy clay loam that has mottles in shades of red, brown, and yellow. It is brownish yellow in the upper part and reddish yellow and brittle in the lower part.

The nearly level and gently sloping Dothan soils are on broad ridgetops. The surface layer is yellowish brown loamy sand. The subsoil is sandy clay loam. It is brownish yellow in the upper part and mottled in shades of brown, yellow, red, and gray in the lower part.

Tobacco is the main crop grown on the major soils. Because of the thick, sandy surface layer in the Ailey and Fuquay soils, droughtiness and the leaching of plant nutrients are limitations. Farm ponds are used for irrigating crops and watering livestock. No limitations affect agricultural production on the Dothan soils.

A small acreage of this map unit is used for timber production. The woodland is predominantly southern red oak, white oak, yellow-poplar, and loblolly pine. Droughtiness is a limitation in the Fuquay and Ailey soils. No limitations affect woodland management in the Dothan soils.

Some areas of this map unit have been developed for urban uses. In areas of the Fuquay and Dothan soils, onsite sewage disposal is limited by a perched water table in the lower part of the subsoil during wet periods. In areas of the Ailey soils, it is limited by slow permeability in the lower part of the subsoil.

3. Mooshaunee-Hallison-Mayodan-Pinkston

Gently sloping to steep, moderately deep and deep, moderately well drained to excessively drained soils that have a loamy or clayey subsoil; on uplands

This map unit is in the central part of the county. The landscape is characterized by prominent relief. Gently sloping ridges are separated by strongly sloping to steep side slopes. Slopes range from 2 to 40 percent. Numerous short drainageways are notched into the side slopes. The drainageways join to form creeks that flow in winding courses through the relatively broad flood plains. The natural vegetation is mainly pine and hardwoods.

About 15 percent of the acreage in this map unit has been cleared of trees. Corn, soybeans, tobacco, small grain, and garden crops are grown in small patches on the ridgetops. The rest of the cleared acreage is used as pasture. The uncleared acreage consists of rolling, steep areas that generally are in pine.

This map unit makes up about 16 percent of the county. It is about 34 percent Mooshaunee and Hallison soils, 26 percent Mayodan soils, 12 percent Pinkston soils, and 28 percent soils of minor extent. The minor soils are Creedmoor and Iredell soils in the uplands and Chewacla, Congaree, Wehadkee, Tetotum, and Masada soils on flood plains and terraces.

The gently sloping to moderately steep, moderately deep, moderately well drained Mooshaunee soils and well drained and moderately well drained Hallison soils are on ridgetops and side slopes. The surface layer of both soils is yellowish brown silt loam. The subsoil of both soils is mainly brownish silty clay loam that has yellow, brown, or gray mottles. Soft bedrock is at a depth of 37 inches.

The gently sloping to moderately steep, deep, well drained Mayodan soils are on ridgetops and side slopes. The surface layer is brown fine sandy loam. The subsoil is clay and silty clay loam. It is yellowish red in the upper part and red in the lower part.

The strongly sloping to steep, moderately deep, well drained to excessively drained Pinkston soils are on side slopes. The surface layer is dark brown silt loam. The upper part of the subsoil is brown fine sandy loam. The lower part is reddish brown sandy loam that has

irregularly shaped bodies of clay loam. Typically hard bedrock is at a depth of 36 inches.

The gently sloping and strongly sloping major soils are used for corn, soybeans, small grain, hay, pasture, or horticultural crops. Surface runoff and the hazard of erosion are the major management concerns. In some areas ponds provide water for irrigation.

Most of the major soils in this map unit are used for timber production. Loblolly pine is the predominant species. Hardwoods, such as white oak, southern red oak, hickory, red maple, Virginia pine, sweetgum, and yellow-poplar, are of minor extent. The hardwoods generally are on the steeper slopes and along streams. Erosion is a hazard along logging roads and skid trails. The steep slopes limit the use of wheeled equipment.

This map unit has little significant urban development, except for scattered single-family dwellings. The clayey subsoil is the major limitation in areas of the Mayodan soils. The wetness and the depth to soft bedrock are the major limitations in areas of the Mooshaunee and Hallison soils. The slope and the depth to hard bedrock are the major limitations in areas of the Pinkston soils.

4. Nason-Georgeville-Goldston

Gently sloping to steep, deep to shallow, well drained to excessively drained soils that have a clayey or loamy subsoil; on uplands

This map unit is in the northwestern part of the county. The landscape is characterized by prominent relief. Strongly sloping to steep side slopes separate narrow, winding, gently sloping ridgetops. Slopes range from 2 to more than 45 percent. Numerous short drainageways on side slopes join to form creeks that flow in winding courses through the narrow flood plains. They are flanked by strongly sloping to steep side slopes that have areas of rock outcrop. The natural vegetation is mainly hardwoods and pine.

About 20 percent of the acreage in this map unit has been cleared of trees. Corn, soybeans, small grain, and garden crops are grown on the gently sloping ridgetops and the strongly sloping side slopes. The rest of the cleared acreage is used as pasture.

This map unit makes up about 25 percent of the county. It is 40 percent Nason soils, 25 percent Georgeville soils, 15 percent Goldston soils, and 20 percent soils of minor extent. The minor soils are Lignum, Iredell, and Tatum soils in the uplands and Chewacla, Congaree, Wehadkee, and Tetotum soils on flood plains and terraces.

The gently sloping to moderately steep, moderately deep, well drained Nason soils are on ridgetops and side slopes. The surface layer is yellowish brown silt loam. The subsoil is strong brown silty clay loam.

The gently sloping to strongly sloping, deep, well drained Georgeville soils are on ridgetops and side slopes. The surface layer is yellowish red gravelly silt loam. The subsoil is red clay in the upper part and red silty clay loam in the lower part.

The gently sloping to steep, shallow, well drained to excessively drained Goldston soils are on side slopes bordering the major creeks and rivers. These soils are very channery silt loam throughout. The surface layer is brown, and the subsoil is light yellowish brown.

The gently sloping to strongly sloping major soils are used for corn, soybeans, small grain, milo, or garden crops. Surface runoff and the hazard of erosion are the major management concerns. Overgrazing is a major concern in managing pasture.

Most of the soils in this map unit are used for timber production. The woodland is predominantly white oak, southern red oak, hickory, red maple, shortleaf pine, and loblolly pine. Erosion is a hazard along logging roads and skid trails. The shallowness of the Goldston soils is a limitation.

The clayey subsoil is the major limitation affecting urban uses on the Nason and Georgeville soils. The major limitations in areas of the Goldston soils are the slope and the depth to bedrock.

5. Bibb

Nearly level, deep, poorly drained soils that are loamy throughout; on flood plains

This map unit is on broad flood plains along Drowning Creek in the southern part of the county. The natural vegetation is mixed hardwoods.

Almost all of this map unit is used as woodland. It makes up about 1 percent of the county. It is about 85 percent Bibb soils and 15 percent soils of minor extent. The minor soils are Wehadkee soils along the intersections of streams that flow through Piedmont material and Gilead soils on low, narrow ridges that extend into the map unit.

The Bibb soils have a surface layer of black loam. The underlying material is dark grayish brown fine sandy loam in the upper part, light brownish gray fine sandy loam in the next part, and grayish brown sandy loam in the lower part.

This map unit is not used for agricultural production or for urban or recreational uses. The wetness and the frequent flooding are the major limitations.

Although this map unit is used as woodland, it is not used extensively for lumber production because of the wetness and the flooding. Common species are yellow-poplar, sweetgum, water oak, Atlantic white-cedar, and loblolly pine.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit is given under "Use and Management of the Soils."

The map units on the detailed soil maps represent areas on the landscape and consist mainly of one or more soils for which the units are named.

Symbols identifying the soils precede the map unit names in the map unit descriptions. The descriptions include general facts about the soils and give the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are named as phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Vaucluse gravelly sandy loam, 2 to 8 percent slopes, is a phase of the Vaucluse series.

Some map units are made up of two or more major soils. These map units are called soil complexes, soil associations, or undifferentiated groups.

A *soil complex* consists of two or more dominant soils, or miscellaneous land areas, in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Candor-Urban land complex, 2 to 12 percent slopes, is an example.

An *undifferentiated group* is made up of two or more dominant soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in a mapped area are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Tatum and Nason channery silt loams, 15 to 25 percent slopes, is an undifferentiated group in this survey area.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, quarry, is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and suitabilities for many uses. The Glossary defines many of the terms used in describing the soils.

AeB—Ailey loamy sand, 2 to 8 percent slopes. This gently sloping, well drained soil is on uplands in the Sandhills. Individual areas are elongated or irregular in shape and range from 5 to more than 200 acres in size.

Typically, the surface layer is dark gray loamy sand 3 inches thick. The subsurface layer is brownish yellow sand 27 inches thick. The upper part of the subsoil extends to a depth of 42 inches. It is brownish yellow sandy clay loam that has reddish yellow mottles. The lower part extends to a depth of 50 inches. It is brittle, reddish yellow sandy clay loam that has reddish yellow, brownish yellow, and red mottles. The underlying material to a depth of 84 inches is sandy loam. The

upper part is yellowish red and has brownish yellow mottles. The lower part is reddish yellow and has mottles in shades of yellow, gray, brown, white, and red.

Included with this soil in mapping are small areas of Bibb, Candor, Gilead, and Vaucluse soils. The poorly drained Bibb soils are along drainageways. The somewhat excessively drained Candor soils are in the slightly higher, less sloping areas. The moderately well drained Gilead soils are near the head of drainageways, on toe slopes, and in small seepage areas adjacent to drainageways. Vaucluse soils are in the more sloping areas. Also included are wet spots, which are identified by a special symbol on the soil maps. Included soils make up about 25 percent of this map unit.

Permeability is moderate in the upper part of the subsoil of the Ailey soil and slow in the lower part. Available water capacity is low. Runoff is slow. The hazard of erosion is moderate where the surface is bare. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. The dense, compact lower part of the subsoil restricts root penetration.

Most of the acreage of this soil is used as woodland. The rest is used for cropland, homesites, or golf courses.

The crops commonly grown on this soil are corn, soybeans, tobacco, small grain, hay, and pasture. The leaching of plant nutrients, the low available water capacity, and the hazards of wind erosion and water erosion are the main management concerns. Conservation cropping systems, cover crops, crop residue management, and windbreaks help to control wind erosion and water erosion and minimize leaching. Bermudagrass hybrids are the primary species grown for hay and pasture. Rotation grazing and prevention of overgrazing help to keep the pasture in good condition.

The dominant trees are loblolly pine, longleaf pine, and blackjack oak. The understory includes sassafras, greenbrier, blueberry, and pineland threeawn. The main limitations are the sandy surface layer and droughtiness. The loose, sandy layers in the upper 20 to 40 inches hinder the use of wheeled equipment, especially when the soil is saturated or very dry.

The slow permeability in the subsoil is the major limitation affecting septic tank absorption fields. It can be overcome by extending the distribution lines to provide a larger absorption area. Maintaining lawns may be difficult because of droughtiness. Drought-tolerant grasses and shrubs should be selected for planting. No major limitations affect local roads and streets.

No major limitations affect recreational development. Maintaining golf fairways may be difficult because of droughtiness.

The land capability subclass is IIIs. Based on longleaf pine as the indicator species, the woodland ordination symbol is 4S.

AeD—Ailey loamy sand, 8 to 15 percent slopes. This strongly sloping, well drained soil is on side slopes in the uplands in the Sandhills. Individual areas are elongated or irregular in shape and range from 5 to more than 100 acres in size.

Typically, the surface layer is dark gray loamy sand 3 inches thick. The subsurface layer is brownish yellow sand 27 inches thick. The upper part of the subsoil extends to a depth of 42 inches. It is brownish yellow sandy clay loam that has reddish yellow mottles. The lower part extends to a depth of 50 inches. It is brittle, reddish yellow sandy clay loam that has reddish yellow, brownish yellow, and red mottles. The underlying material to a depth of 84 inches is sandy loam. The upper part is yellowish red and has brownish yellow mottles. The lower part is reddish yellow and has mottles in shades of yellow, gray, brown, white, and red.

Included with this soil in mapping are small areas of Bibb, Gilead, and Vaucluse soils. The poorly drained Bibb soils are along drainageways. The moderately well drained Gilead soils are at the head of drainageways, on toe slopes, and along drainageways. Vaucluse soils are mainly in the slightly more convex and more sloping areas. Also included are wet spots, which are identified by a special symbol on the soil maps. Included soils make up about 20 percent of this map unit.

Permeability is moderate in the upper part of the subsoil of the Ailey soil and slow in the lower part. Available water capacity is low. Runoff is slow. The hazard of erosion is severe where the surface is bare. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. The dense, compact lower part of the subsoil restricts root penetration.

Most of the acreage of this soil is used as woodland or pasture. Only a very small acreage is used for crop production.

The commonly grown crops are corn, soybeans, tobacco, and small grain. The leaching of plant nutrients, the slope, the low available water capacity, and the hazards of wind erosion and water erosion are the main management concerns. Conservation cropping systems, winter cover crops, crop residue management, and windbreaks help to control wind erosion and water erosion and minimize leaching. Bermudagrass hybrids are the primary species grown for hay and pasture. Rotation grazing and prevention of overgrazing help to keep the pasture in good condition.

The dominant trees are loblolly pine, longleaf pine,

and blackjack oak. The understory includes sassafras, greenbrier, blueberry, and pineland threeawn. The main limitations are the sandy surface layer and droughtiness. The loose, sandy layers in the upper 20 to 40 inches hinder the use of wheeled equipment when timber is harvested, especially when the soil is saturated or very dry.

The slow permeability, the slope, and droughtiness are the main limitations affecting urban development. Extending the distribution lines to provide a larger absorption area can help to overcome the slow permeability. Maintaining lawns may be difficult because of droughtiness. Drought-tolerant grasses and shrubs should be selected for planting. No major limitations affect local roads and streets.

The slope is the major limitation affecting recreational development. This limitation can be overcome by proper planning and careful site selection of recreational facilities. Maintaining golf fairways may be difficult because of droughtiness.

The land capability subclass is VIs. Based on longleaf pine as the indicator species, the woodland ordination symbol is 4S.

Bb—Bibb loam, 0 to 2 percent slopes, frequently flooded. This nearly level, poorly drained soil is on flood plains on the Coastal Plain. Individual areas are long and narrow and range from 10 to more than 200 acres in size.

Typically, the surface layer is black loam 12 inches thick. The underlying material extends to a depth of 70 inches. It is dark grayish brown fine sandy loam in the upper part, light brownish gray fine sandy loam in the next part, and grayish brown sandy loam in the lower part.

Included with this soil in mapping are similar soils that have a surface layer of fine sandy loam, sandy loam, or silt loam. Also included are intermingled areas where the black surface layer is more than 24 inches thick and small areas where the subsoil has more clay than is typical for the Bibb soil. Included soils make up about 25 percent of this map unit.

Permeability is moderate in the Bibb soil. Available water capacity is high. Runoff is slow. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. The seasonal high water table is at or above the surface during most of the year. This soil is frequently flooded.

Most of the acreage of this soil is used as woodland. The rest is used as pasture.

This soil is generally unsuited to cultivation. The frequent flooding and the wetness are the major management concerns. A drainage system is needed for optimum yields. Bermudagrass hybrids are the primary species grown for hay and pasture. Restricted grazing during wet periods and rotation grazing help to keep the pasture in good condition.

The dominant trees are loblolly pine, sweetgum, yellow-poplar, blackgum, water oak, and Atlantic white-cedar. The understory includes blackgum, common reed, and redbay. The major management concerns are the flooding and the wetness. They restrict the use of equipment and increase the seedling mortality rate. They can be overcome by installing a drainage system, such as subsurface tile and ditches.

The wetness and the flooding are the major limitations affecting septic tank absorption fields, dwellings with or without basements, and local roads and streets. Because it is on flood plains, this soil should not be used as a site for dwellings. The wetness and the flooding on sites for local roads and streets can be overcome by constructing the roadbeds above the known flood stage.

The flooding and the wetness are the major limitations affecting recreational development. Floodwater can damage any structure built on this soil.

The land capability subclass is Vw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9W.

CaB—Candor sand, 0 to 4 percent slopes. This nearly level and gently sloping, somewhat excessively drained soil is on Coastal Plain uplands. Individual areas are irregular in shape and range from 5 to more than 500 acres in size.

Typically, the surface layer is grayish brown sand 13 inches thick. The subsurface layer extends to a depth of 26 inches. It is light yellowish brown sand. The subsoil extends to a depth of 80 inches. The upper part is yellowish brown loamy sand. The next part is light yellowish brown sand that has very pale brown and yellowish brown mottles. The lower part is yellowish brown sandy loam that has light yellowish brown and strong brown mottles.

Included with this soil in mapping are small areas of the well drained Ailey and Fuquay soils. These soils are in the lower, more sloping areas. Also included are wet spots, which are identified by a special symbol on the soil maps. Included soils make up about 10 percent of this map unit.

Permeability is rapid in the upper layers of the Candor soil and moderate in the lower part of the subsoil. Available water capacity is very low. Runoff is very slow. Reaction is extremely acid to strongly acid, except where the surface layer has been limed. The hazard of wind erosion is severe.

Most of the acreage of this soil is used as woodland. The rest is used for cropland, pasture, subdivisions, or golf courses.

An irrigation system is used in areas where crops, such as corn, tobacco, and soybeans, are grown. Droughtiness, the leaching of plant nutrients, and the hazard of wind erosion are the main management concerns. Cover crops, crop residue management, and windbreaks help to control wind erosion, minimize leaching, and conserve moisture. Specialty crops, such as peaches and grapes, grow well on this soil without irrigation, but a proper irrigation system can greatly increase yields. Bermudagrass hybrids are the primary species grown for hay and pasture. Pasture management includes measures that maintain the protective plant cover, rotation grazing, and prevention of overgrazing.

The dominant trees are longleaf pine, loblolly pine, and turkey oak. The understory includes pineland threeawn, flowering dogwood, and sassafras. The main limitations are the sandy surface layer and droughtiness. The loose, sandy layers in the upper 20 to 40 inches hinder the use of wheeled equipment, especially when the soil is saturated or very dry.

No major limitations affect septic tank absorption fields or dwellings with or without basements. Because of droughtiness and the rapid leaching, establishing and maintaining lawns may be difficult. Drought-tolerant grasses and shrubs should be selected for planting. No major limitations affect local roads and streets.

The sandy surface layer is the main limitation affecting recreational development. The plant cover generally can be maintained by controlling foot traffic. Establishing and maintaining golf fairways may be difficult because of droughtiness and the rapid leaching.

The land capability subclass is IIIs. Based on longleaf pine as the indicator species, the woodland ordination symbol is 4S.

CaC—Candor sand, 4 to 12 percent slopes. This gently sloping to strongly sloping, somewhat excessively drained soil is on broad, smooth Coastal Plain uplands. Individual areas are irregular in shape and range from 5 to more than 100 acres in size.

Typically, the surface layer is grayish brown sand 13 inches thick. The subsurface layer extends to a depth of 26 inches. It is light yellowish brown sand. The subsoil extends to a depth of 80 inches. The upper part is yellowish brown loamy sand. The next part is light yellowish brown sand that has very pale brown and yellowish brown mottles. The lower part is yellowish brown sandy loam that has light yellowish brown and strong brown mottles.

Included with this soil in mapping are small areas of Ailey, Bibb, and Vaucluse soils. The well drained Ailey soils are in scattered areas throughout the map unit. The poorly drained Bibb soils are along drainageways. The well drained Vaucluse soils are in the more sloping areas. Also included are wet spots, which are identified by a special symbol on the soil maps. Included soils make up about 15 percent of this map unit.

Permeability is rapid in the upper layers of the Candor soil and moderate in the lower part of the subsoil. Available water capacity is very low. Runoff is slow or very slow. Reaction is extremely acid to strongly acid, except where the surface layer has been limed. The hazard of wind erosion is severe.

Most of the acreage of this soil is used as woodland. The rest is used for cropland, pasture, urban development, or golf courses.

An irrigation system is used in areas where crops, such as corn, soybeans, and tobacco, are grown. The slope, droughtiness, the leaching of plant nutrients, and the hazard of wind erosion are the main management concerns. Minimum tillage, cover crops, crop residue management, and windbreaks help to control wind erosion and conserve moisture. Specialty crops, such as peaches and grapes, grow very well on this soil without irrigation, but consistent yields of these crops can be greatly increased if an irrigation system is used. Bermudagrass hybrids are the primary species grown for hay and pasture. Pasture management includes measures that maintain the protective plant cover, rotation grazing, and prevention of overgrazing.

The dominant trees are longleaf pine, loblolly pine, and turkey oak. The understory includes pineland threeawn, flowering dogwood, and sassafras. The main limitations are the sandy surface layer and droughtiness. The loose, sandy layers in the upper 20 to 40 inches hinder the use of wheeled equipment when timber is harvested, especially when the soil is saturated or very dry.

This soil has a moderate limitation affecting septic tank absorption fields and dwellings with or without basements. Because of droughtiness, establishing and maintaining lawns may be difficult. Drought-tolerant grasses and shrubs should be selected for planting. The slope is a moderate limitation on sites for local roads and streets.

The sandy surface layer is the main limitation affecting recreational development. The plant cover generally can be maintained by controlling foot traffic. Establishing and maintaining golf fairways may be difficult because of droughtiness.

The land capability subclass is IVs. Based on longleaf pine as the indicator species, the woodland ordination symbol is 4S.

CbC—Candor-Urban land complex, 2 to 12 percent slopes. This complex occurs as areas of a gently sloping to strongly sloping, somewhat excessively drained Candor soil intermingled with areas of Urban land. It is about 60 percent Candor soil and 30 percent Urban land. The Candor soil and Urban land occur as areas in such an intricate pattern that mapping them separately was not practical. This complex is in and around towns and suburban developments in the Sandhills. Individual areas are broad and irregular in shape and range from 50 to 300 acres in size.

Typically, the surface layer of the Candor soil is grayish brown sand 13 inches thick. The subsurface layer extends to a depth of 26 inches. It is light yellowish brown sand. The subsoil extends to a depth of 80 inches. The upper part is yellowish brown loamy sand. The next part is light yellowish brown sand that has very pale brown and yellowish brown mottles. The lower part is yellowish brown sandy loam that has light yellowish brown and strong brown mottles.

Urban land consists of areas covered by concrete, asphalt, buildings, or other structures.

Included in mapping are small areas of Ailey, Bibb, and Vaucluse soils. The well drained Ailey soils are in scattered areas throughout the map unit. The poorly drained Bibb soils are along drainageways. The well drained Vaucluse soils are commonly in the more sloping areas. Also included are wet spots, which are identified by a special symbol on the soil maps. Included soils make up less than 10 percent of this map unit.

Permeability is rapid in the upper layers of the Candor soil and moderate in the lower part of the subsoil. Available water capacity is very low in this soil. Runoff is slow in the Candor soil. It is high on the Urban land because of the structures covering the soils. Reaction is extremely acid to strongly acid in the Candor soil, except where the surface layer has been limed.

The Candor soil is used for building sites, lawns, gardens, bridle paths, racetracks, stables, golf courses, trees and shrubs, and public recreational areas. Because of droughtiness and the rapid leaching, establishing and maintaining lawns and golf fairways are difficult. Frequent applications of fertilizer, particularly nitrogen, are needed to establish and maintain lawns, gardens, and golf courses. An irrigation system is needed to help to maintain the plant cover during periods of limited rainfall.

The land capability subclass is IVs in areas of the Candor soil and VIIIs in areas of Urban land. This map unit is not assigned a woodland ordination symbol.

Ch—Chewacla silt loam, 0 to 2 percent slopes, frequently flooded. This nearly level, somewhat poorly drained soil is on flood plains along the major streams. Individual areas are long and narrow and range from 5 to more than 200 acres in size.

Typically, the surface layer is dark brown silt loam 5 inches thick. The subsoil extends to a depth of 36 inches. In sequence downward, it is yellowish brown loam that has yellowish red mottles; brown loam that has strong brown, yellowish brown, and dark reddish brown mottles; brown fine sandy loam that has strong brown, dark reddish brown, and pinkish gray mottles; and brown silt loam that has brownish yellow and light gray mottles. The underlying material to a depth of 70 inches is light gray silt loam that has brownish yellow and red mottles.

Included with this soil in mapping are small areas of Congaree and Wehadkee soils. The moderately well drained and well drained Congaree soils are along stream channels. The poorly drained Wehadkee soils are along toe slopes of the adjacent uplands. Included soils make up about 20 percent of this map unit.

Permeability is moderate in the Chewacla soil. Runoff is slow. Available water capacity is high. Reaction ranges from very strongly acid to slightly acid. The seasonal high water table is 0.5 foot to 1.5 feet below the surface in late winter and early spring. This soil is frequently flooded for brief to long periods.

Most of the acreage of this soil is used as woodland. Only a small acreage is cleared of trees and used for crops and pasture.

The crops commonly grown on this soil are corn, soybeans, hay, and pasture. The flooding is the major management concern. A drainage system is needed for optimum yields. Fescue is the primary species grown for hay and pasture. Proper pasture management includes rotation grazing and timely deferment of grazing during wet periods, which help to reduce surface compaction and maintain tilth.

The dominant trees are yellow-poplar, sweetgum, willow oak, southern red oak, American sycamore, water oak, American beech, and loblolly pine. The understory includes flowering dogwood, sourwood, sassafras, greenbrier, and American holly. Limiting the use of equipment during wet periods helps to avoid compaction and loss of productivity. Bedding may be needed before loblolly pine is planted.

The wetness and the flooding are the main limitations affecting septic tank absorption fields and dwellings with or without basements. Because of these limitations, this soil should not be used as a site for dwellings. The wetness, the flooding, and low strength are the major limitations affecting local roads and streets. Excess

water can be removed by using shallow ditches and providing the proper grade. Properly designing local roads and streets helps to offset the limited ability of the soil to support a load.

The wetness and the flooding are the major limitations affecting recreational development. Areas used for recreational development should be as undisturbed as possible. Foot traffic in these areas should be controlled.

The land capability subclass is IVw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 10W.

Co—Congaree loam, 0 to 2 percent slopes, frequently flooded. This nearly level, well drained and moderately well drained soil is adjacent to streams on flood plains. Individual areas are long and narrow and range from 5 to more than 100 acres in size.

Typically, the surface layer is dark yellowish brown loam 10 inches thick. The underlying material extends to a depth of 70 inches. In sequence downward, it is yellowish brown loam that has light yellowish brown mottles, yellowish brown loam that has dark yellowish brown and light yellowish brown mottles, yellowish brown loam that has pale brown and light yellowish brown mottles, and yellowish brown silt loam that has very pale brown and dark yellowish brown mottles.

Included with this soil in mapping are small areas of the somewhat poorly drained Chewacla and poorly drained Wehadkee soils in the lower areas. These soils make up about 20 percent of this map unit.

Permeability is moderate in the Congaree soil. Available water capacity is medium. Runoff is slow. Reaction is very strongly acid to neutral, except where the surface layer has been limed. The seasonal high water table is at a depth of 2.5 to 4.0 feet in late winter and early spring. This soil is frequently flooded for brief periods.

Most of the acreage of this soil is used as woodland. A small acreage is used as cropland or pasture.

The commonly grown crops are corn, soybeans, and small grain. The flooding is the major hazard. Flood-control measures are needed for most uses. Fescue is the primary species grown for hay and pasture. Proper pasture management includes rotation grazing and timely deferment of grazing during wet periods, which help to reduce surface compaction and maintain tilth.

The dominant trees are yellow-poplar, sweetgum, willow oak, American sycamore, green ash, water oak, American beech, and loblolly pine. The understory includes flowering dogwood, sassafras, sourwood, American holly, and greenbrier. No major limitations affect timber production.

The flooding is the major hazard affecting most urban uses. Dwellings in these areas are subject to flood damage. Low strength and the flooding are the major limitations affecting local roads and streets. Properly designing local roads and streets helps to offset the limited ability of the soil to support a load.

The flooding is the major hazard affecting recreational development. Areas used for recreational development should be as undisturbed as possible, and access should be controlled.

The land capability subclass is IIIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9A.

CrB—Creedmoor fine sandy loam, 2 to 6 percent slopes. This gently sloping, moderately well drained and somewhat poorly drained soil is on ridges on Piedmont uplands. Individual areas are irregular in shape and range from 5 to 100 acres in size.

Typically, the surface layer is pale brown fine sandy loam 3 inches thick. The subsurface layer is 5 inches of light yellowish brown loam that has pale brown and brownish yellow mottles. The subsoil extends to a depth of 59 inches. In sequence downward, it is brownish yellow silty clay loam that has reddish yellow mottles; brownish yellow clay that has strong brown, dark yellowish brown, and red mottles; yellowish brown clay that has strong brown, light gray, and reddish brown mottles; and reddish brown silty clay loam that has greenish gray and strong brown mottles. The underlying material to a depth of 83 inches is reddish brown silty clay loam that has yellowish red, reddish brown, gray, and light greenish gray mottles. Soft bedrock that crushes to silt loam extends to a depth of 99 inches.

Included with this soil in mapping are small areas of Mayodan and Pinkston soils. The well drained Mayodan soils are on small knobs and ridgetops. The well drained to excessively drained Pinkston soils are in the steeper areas. Included soils make up about 15 percent of this map unit.

Permeability is very slow in the Creedmoor soil. Available water capacity and the shrink-swell potential are moderate. Runoff is medium. Reaction is extremely acid to strongly acid, except where the surface layer has been limed. The seasonal high water table is 1.5 to 2.0 feet below the surface during wet periods.

Most of the acreage of this soil is used as woodland. The rest is used as cropland or pasture.

The commonly grown crops are corn, soybeans, and small grain. The hazard of erosion and the wetness are the main management concerns. Minimum tillage, crop residue management, terraces, diversions, field borders, and a cropping system that includes close-growing crops help to control erosion. Cultivating the soil during wet periods results in surface compaction and the

deterioration of tilth. Fescue is commonly used for hay and pasture. Pasture management includes rotation grazing and timely deferment of grazing during wet periods, which help to reduce compaction and maintain tilth.

The dominant trees are loblolly pine, shortleaf pine, water oak, sweetgum, and red maple. The understory includes flowering dogwood, eastern redbud, sourwood, and winged elm. The wetness is the major limitation. Limiting the use of equipment during wet periods helps to avoid compaction and controls erosion.

The very slow permeability, the wetness, and the moderate shrink-swell potential are the major limitations affecting septic tank absorption fields and dwellings with or without basements. Increasing the size of the absorption area, reinforcing the foundations, and installing a drainage system around dwellings helps to overcome these limitations. Low strength is the major limitation affecting local roads and streets. It can be overcome by using coarse textured base material, such as sand or gravel, to increase strength.

The very slow permeability and the wetness are the major limitations affecting recreational development. A good drainage system is needed in intensively used areas, such as playgrounds. The plant cover can be maintained by controlling foot traffic.

The land capability subclass is IIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9A.

CrC—Creedmoor fine sandy loam, 6 to 10 percent slopes. This moderately sloping, moderately well drained and somewhat poorly drained soil is on side slopes in the Piedmont uplands. Individual areas are irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is pale brown fine sandy loam 3 inches thick. The subsurface layer is 5 inches of light yellowish brown loam that has pale brown and brownish yellow mottles. The subsoil extends to a depth of 59 inches. In sequence downward, it is brownish yellow silty clay loam that has reddish yellow mottles; brownish yellow clay that has strong brown, dark yellowish brown, and red mottles; yellowish brown clay that has strong brown, light gray, and reddish brown mottles; and reddish brown silty clay loam that has greenish gray and strong brown mottles. The underlying material to a depth of 83 inches is reddish brown silty clay loam that has yellowish red, reddish brown, gray, and light greenish gray mottles. Soft bedrock that crushes to silt loam extends to a depth of 99 inches.

Included with this soil in mapping are small areas of Mayodan and Pinkston soils. The well drained Mayodan soils are on small knobs and ridgetops. The well drained to excessively drained Pinkston soils are in the steeper areas. Also included are eroded spots where the subsoil is exposed. Included soils make up about 25 percent of this map unit.

Permeability is very slow in the Creedmoor soil. Available water capacity and the shrink-swell potential are moderate. Runoff is rapid. Reaction is extremely acid to strongly acid, except where the surface layer has been limed. The seasonal high water table is 1.5 to 2.0 feet below the surface during wet periods.

Most of the acreage of this soil is used as woodland. The rest is used as pasture or for small areas of cultivated crops.

This soil can be used for most of the cultivated crops grown in the county. The hazard of erosion and the wetness are the major management concerns. Minimum tillage, crop residue management, terraces, diversions, field borders, grassed waterways, and a cropping system that includes close-growing crops help to control erosion. Cultivating or tilling the soil during wet periods results in surface compaction and the deterioration of tilth. Fescue is commonly used for hay and pasture. Pasture management includes rotation grazing and timely deferment of grazing during wet periods, which help to reduce compaction and maintain tilth.

The dominant trees are loblolly pine, shortleaf pine, water oak, sweetgum, and red maple. The understory includes flowering dogwood, eastern redbud, sourwood, and winged elm. The wetness is the major limitation. Limiting the use of equipment during wet periods helps to avoid compaction and control erosion.

The very slow permeability, the wetness, and the moderate shrink-swell potential are the major limitations affecting septic tank absorption fields and dwellings with or without basements. Increasing the size of the absorption area, reinforcing the foundations, and installing a drainage system around dwellings helps to overcome these limitations. Low strength is the major limitation affecting local roads and streets. It can be overcome by using coarse textured base material, such as sand or gravel, to increase strength.

The very slow permeability and the wetness are the major limitations affecting recreational development. A good drainage system is needed in intensively used areas, such as playgrounds. The plant cover can be maintained by controlling foot traffic.

The land capability subclass is IIIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9A.

DoA—Dothan loamy sand, 0 to 2 percent slopes. This nearly level, well drained soil is on broad, smooth ridgetops on Coastal Plain uplands. Individual areas are elongated or irregular in shape and range from 5 to 200 acres in size.

Typically, the surface layer is yellowish brown loamy sand 11 inches thick. The subsoil extends to a depth of 84 inches. The upper part is brownish yellow sandy clay loam. The next part is brownish yellow sandy clay loam that has strong brown mottles. The lower part is firm and compact, mottled strong brown, brownish yellow, light gray, and red sandy clay loam.

Included with this soil in mapping are small areas of Fuquay, Gilead, and Vaucluse soils. Fuquay soils have a thick, sandy surface layer and are in scattered areas throughout the map unit. The moderately well drained Gilead soils are in the lower areas. Vaucluse soils are in the more sloping areas. Also included are wet spots, which are identified by a special symbol on the soil maps. Included soils make up about 15 percent of the map unit.

Permeability is moderate in the upper part of the subsoil of the Dothan soil and moderately slow in the lower part. Available water capacity is moderate. Runoff is slow. Reaction is very strongly acid to moderately acid, except where the surface layer has been limed. A perched water table is 3 to 5 feet below the surface during wet periods.

Most of the acreage of the soil is used as cropland. Some areas are used for hay or pasture. A very small acreage is used as woodland.

The commonly grown crops are corn, soybeans, tobacco, and small grain. No major limitations affect crop production on this soil. Minimum tillage, crop rotations, cover crops, and crop residue management help to conserve moisture. Bermudagrass hybrids are the primary species grown for hay and pasture. Pasture management includes measures that maintain the plant cover and rotation grazing.

The dominant trees are longleaf pine, loblolly pine, hickory, and water oak. The understory includes flowering dogwood, sassafras, eastern redbud, greenbrier, and red maple. No major limitations affect timber production.

The slow permeability and the wetness are the major limitations affecting septic tank absorption fields and dwellings with basements. Increasing the size of the absorption area and installing a drainage system around dwellings help to overcome these limitations. No limitations affect local roads and streets.

No limitations affect recreational development.

This soil is in land capability class I. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9A.

DoB—Dothan loamy sand, 2 to 6 percent slopes. This gently sloping, well drained soil is on broad ridgetops on Coastal Plain uplands. Individual areas are oblong and range from 5 to 100 acres in size.

Typically, the surface layer is yellowish brown loamy sand 11 inches thick. The subsoil extends to a depth of 84 inches. The upper part is brownish yellow sandy clay loam. The next part is brownish yellow sandy clay loam that has strong brown mottles. The lower part is firm and compact, mottled strong brown, brownish yellow, light gray, and red sandy clay loam.

Included with this soil in mapping are small areas of Fuquay, Gilead, and Vaucluse soils. Fuquay soils have a thick, sandy surface layer and are intermingled with areas of the Dothan soil on the gently sloping ridges. The moderately well drained Gilead soils are on side slopes along drainageways and at the head of drainageways. Vaucluse soils are along the edges of the map unit and along slope breaks. Also included are wet spots, which are identified by a special symbol on the soil maps. Included soils make up about 25 percent of this map unit.

Permeability is moderate in the upper part of the subsoil of the Dothan soil and moderately slow in the lower part. Available water capacity is moderate. Runoff is medium. Reaction is very strongly acid to moderately acid, except where the surface layer has been limed. A perched water table is 3 to 5 feet below the surface during wet periods.

Most of the acreage of this soil is used as cropland. Some areas are used for hay or pasture. A very small acreage is used as woodland.

The commonly grown crops are corn, soybeans, tobacco, and small grain. No major limitations affect crop production on this soil. Minimum tillage, crop rotations, cover crops, and crop residue management help to conserve moisture. Bermudagrass hybrids are the primary species grown for hay and pasture. Pasture management includes measures that maintain the plant cover and rotation grazing.

The dominant trees are longleaf pine, loblolly pine, hickory, and water oak. The understory includes flowering dogwood, sassafras, eastern redbud, greenbrier, and red maple. No major limitations affect timber production.

The slow permeability and the wetness are the major limitations affecting septic tank absorption fields and dwellings with basements. Increasing the size of the absorption area and installing a drainage system around dwellings help to overcome these limitations. No limitations affect local roads and streets.

No limitations affect recreational development.

The land capability subclass is IIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9A.

FaB—Fuquay loamy sand, 0 to 6 percent slopes. This nearly level and gently sloping, well drained soil is

on broad ridges on Coastal Plain uplands. Individual areas are oblong and range from 5 to 150 acres in size.

Typically, the surface layer is brown loamy sand 11 inches thick. The subsurface layer extends to a depth of 28 inches. It is very pale brown loamy sand that has brownish yellow mottles. The subsoil extends to a depth of 80 inches. In sequence downward, it is brownish yellow sandy loam that has yellowish brown mottles; brownish yellow sandy clay loam that has yellowish brown, light gray, and red mottles; brownish yellow and light gray sandy clay loam that has strong brown and red mottles; and mottled strong brown, red, brownish yellow, and light gray sandy clay loam that has strata of sandy clay.

Included with this soil in mapping are small areas of Bibb, Dothan, and Gilead soils. The poorly drained Bibb soils are along drainageways. Dothan soils are in the slightly higher areas. The moderately well drained Gilead soils are on short, steep side slopes along and at the head of drainageways. Also included are wet spots, which are identified by a special symbol on the soil maps. Included soils make up about 20 percent of this map unit.

Permeability is moderate in the upper part of the subsoil in the Fuquay soil and slow in the lower part. Available water capacity is low. Runoff is slow. Reaction is very strongly acid to moderately acid, except where the surface layer has been limed. A perched water table is 4 to 6 feet below the surface during wet periods.

Most of the acreage of this soil is used for cropland, hay, or pasture. Only a very small acreage is used as woodland.

The crops commonly grown on this soil are corn, soybeans, tobacco (fig. 3), and small grain. Droughtiness, the leaching of plant nutrients, and the hazard of wind erosion are the major management concerns. Winter cover crops, conservation tillage, crop residue management, and windbreaks help to overcome these limitations. Bermudagrass hybrids are the primary species grown for hay and pasture. Pasture management includes measures that maintain the protective plant cover, which helps to control wind erosion.

The dominant trees are longleaf pine, loblolly pine, and blackjack oak. The understory includes flowering dogwood, sassafras, and greenbrier. The main limitations are the sandy surface layer and droughtiness. The loose, sandy layers in the upper 20 to 40 inches hinder the use of wheeled equipment, especially when the soil is saturated or very dry.

The slow permeability is the major limitation affecting septic tank absorption fields. It can be overcome by extending the drainage lines, which allows the effluent to be treated over a larger area. The seasonal high water table is a limitation on sites for dwellings with basements. Installing tile drainage around foundations helps to overcome this limitation. No limitations affect local roads and streets.

The sandy surface layer is the main limitation affecting recreational development. Maintaining ground cover and controlling access to the area help to overcome this limitation.

The land capability subclass is IIs. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8S.

FuB—Fuquay-Urban land complex, 0 to 6 percent slopes. This map unit occurs as areas of a nearly level and gently sloping, well drained Fuquay soil intermingled with areas of Urban land. It is about 50 percent Fuquay soil and 30 percent Urban land. The Fuquay soil and Urban land occur as areas too small and intermingled to be mapped separately. Most areas are in and around the cities on Coastal Plain uplands. Individual areas are irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer of the Fuquay soil is brown loamy sand 11 inches thick. The subsurface layer extends to a depth of 28 inches. It is very pale brown loamy sand that has brownish yellow mottles. The subsoil extends to a depth of 80 inches. In sequence downward, it is brownish yellow sandy loam that has yellowish brown mottles; brownish yellow sandy clay loam that has yellowish brown, light gray, and red mottles; brownish yellow and light gray sandy clay loam that has strong brown and red mottles; and mottled strong brown, red, brownish yellow, and light gray sandy clay loam that has strata of sandy clay.

Urban land consists of areas covered by concrete, asphalt, buildings, or other structures. The slope has been modified and commonly ranges from 0 to 4 percent.

Included in mapping are small areas of Bibb, Candor, and Vaucluse soils. The poorly drained Bibb soils are along drainageways. The somewhat excessively drained Candor soils are on the slightly higher ridges. Vaucluse soils are on the slightly steeper side slopes. Also included are wet spots, which are identified by a special symbol on the soil maps. Included soils make up about 20 percent of this map unit.

Permeability is moderate in the upper part of the subsoil in the Fuquay soil and slow in the lower part. Available water capacity is low in this soil. Runoff is slow on the Fuquay soil and very rapid on the Urban land. Reaction is very strongly acid to moderately acid in the Fuquay soil, except where the surface layer has

Figure 3.—An area of Fuquay loamy sand, 0 to 6 percent slopes, used for tobacco.

been limed. This soil has a seasonal high water table at a depth of 4 to 6 feet during wet periods.

Undeveloped areas are being converted to urban uses. The sandy surface layer can be easily worked, but it is droughty and plant nutrients are readily leached. Frequent applications of fertilizer, particularly nitrogen, are needed to establish and maintain lawns and vegetable and flower gardens. Erosion is a hazard where the surface layer is not protected by a plant cover.

The sandy surface layer is the main limitation affecting recreational development.

The land capability subclass is IIs in areas of the Fuquay soil and VIIIs in areas of Urban land. This map unit is not assigned a woodland ordination symbol.

GeB—Georgeville gravelly silt loam, 2 to 8 percent slopes. This gently sloping, well drained soil is on broad ridgetops of the Piedmont uplands in the northwestern part of the county. It is dissected by intermittent drainageways. Individual areas are oblong and irregular in shape and range from 5 to more than 200 acres in size.

Typically, the surface layer is yellowish red gravelly silt loam 8 inches thick. The subsoil extends to a depth of 59 inches. The upper part is red clay that has yellowish red mottles. The next part is red clay that has brownish yellow mottles. The lower part is red silty clay loam that has brownish yellow and yellowish brown mottles. The underlying material to a depth of 78 inches

is red silt loam that has brownish yellow and weak red mottles.

Included with this soil in mapping are small areas of Nason soils, which are commonly near the outer edges of the map unit and in the lower positions on the landscape. Also included are small areas of similar soils that have a higher content of clay than is typical for the Georgeville soil. These soils are intermingled with areas of the Georgeville soil. Included soils make up about 20 percent of the map unit.

Permeability is moderate in the Georgeville soil Available water capacity is moderate. The shrink-swell potential is low. Runoff is medium. The hazard of erosion is severe where the surface is bare. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. The depth to bedrock is more than 60 inches.

Most of the acreage of this soil is used as woodland. Some areas are used for hay or pasture. The rest is used for cropland or urban development.

The crops commonly grown on this soil are corn, milo, soybeans (fig. 4), pasture, hay, small grain, and horticultural crops. Surface runoff, the hazard of erosion, and the gravelly surface layer are the main management concerns. Minimum tillage and crop residue management help to control runoff and erosion. Grassed waterways, terraces, diversions, field borders, and a cropping system that includes close-growing crops also help to conserve soil and water The pebbles on the surface are a limitation affecting the use of certain types of equipment, especially during seedbed preparation. The gravelly surface layer can also inhibit the germination of seeds and reduce the plant population. Fescue is the primary species grown for

Figure 4.—A field of soybeans in an area of Georgeville gravelly silt loam, 2 to 8 percent slopes.

pasture and hay. Pasture management includes measures that maintain the protective plant cover, which help to control runoff and erosion.

The dominant trees are loblolly pine, shortleaf pine, Virginia pine, hickory, white oak, and southern red oak. The understory includes flowering dogwood, sourwood, American holly, eastern redcedar, black cherry, and red maple. No major limitations affect woodland management.

No major limitations affect septic tank absorption fields or dwellings with or without basements. Because of the moderate permeability, careful design is needed to ensure that the absorption areas are large enough. Low strength is the main limitation affecting local roads and streets. It can be overcome by using coarse textured base material, such as sand or gravel, to increase strength.

Small stones are the main limitation affecting recreational development.

The land capability subclass is IIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

GeD—Georgeville gravelly silt loam, 8 to 15 percent slopes. This strongly sloping, well drained soil is on side slopes of the Piedmont uplands in the northwestern part of the county. Individual areas are oblong to irregular in shape and range from 4 to more than 50 acres in size.

Typically, the surface layer is yellowish red gravelly silt loam 8 inches thick. The subsoil extends to a depth of 59 inches. The upper part is red clay that has yellowish red mottles. The next part is red clay that has brownish yellow mottles. The lower part is red silty clay loam that has brownish yellow and yellowish brown mottles. The underlying material to a depth of 78 inches is red silt loam that has brownish yellow and weak red mottles.

Included with this soil in mapping are small areas of Tatum and Nason soils, which commonly are in the more sloping areas. These soils have soft bedrock within 40 to 60 inches of the surface. Included soils make up about 10 percent of this map unit.

Permeability is moderate in the Georgeville soil. Available water capacity is moderate. The shrink-swell potential is low. Runoff is medium. The hazard of erosion is severe where the surface is bare. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. The depth to bedrock is more than 60 inches.

Most of the acreage of this soil is used as woodland. Some areas are used for hay or pasture. The rest is used for cropland or urban development.

The crops commonly grown on this soil are corn, soybeans, pasture, hay, small grain, and horticultural crops. The slope, surface runoff, and the hazard of erosion are the main management concerns. Minimum tillage and crop residue management help to control runoff and erosion. Grassed waterways, terraces, diversions, field borders, stripcropping, and a cropping system that includes close-growing crops also help to conserve soil and water. The pebbles are a limitation for certain types of equipment and seedbed preparation. The gravelly surface layer can inhibit the germination of seeds and reduce the plant population. Fescue is the primary species grown for hay and forage. A high level of management is necessary to maintain a protective plant cover, which helps to control runoff and erosion.

The dominant trees are loblolly pine, shortleaf pine, hickory, white oak, and southern red oak. The understory includes flowering dogwood, sourwood, American holly, eastern redcedar, black cherry, and red maple. No major limitations affect woodland management.

No major limitations affect septic tank absorption fields or dwellings with or without basements. Because of the moderate permeability and the slope, careful design is needed to ensure that the absorption areas are large enough. Low strength is the main limitation affecting local roads and streets. It can be overcome by using coarse textured base material, such as sand or gravel, to increase strength.

The slope and small stones are the main limitations affecting recreational development.

The land capability subclass is IVe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

GhB—Gilead loamy sand, 2 to 8 percent slopes. This gently sloping, moderately well drained soil is on smooth ridges and side slopes along drainageways on Coastal Plain uplands. Individual areas are narrow or irregular in shape and range from 5 to 40 acres in size.

Typically, the surface layer is dark grayish brown loamy sand 8 inches thick. The subsoil extends to a depth of 50 inches. In sequence downward, it is brownish yellow sandy clay loam that has reddish yellow mottles; brownish yellow sandy clay that has yellowish red, reddish yellow, and light gray mottles; mottled brownish yellow, red, light gray, and reddish yellow sandy clay; and mottled light gray, red, light reddish brown, reddish yellow, and brownish yellow sandy clay loam that has pockets of sandy clay. The underlying material to a depth of 80 inches is light brown sandy loam that has light gray, very pale brown, and brownish yellow mottles.

Included with this soil in mapping are small areas of Ailey, Bibb, Fuquay, and Vaucluse soils. The well

drained Ailey, Fuquay, and Vaucluse soils are in the slightly higher positions on the landscape and are less clayey than the Gilead soil. The poorly drained Bibb soils are along drainageways. Also included are wet spots, which are identified by a special symbol on the soil maps. Included soils make up about 10 percent of this map unit.

Permeability is slow in the Gilead soil. Available water capacity is moderate. The shrink-swell potential is low. Runoff is medium. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. The seasonal high water table is 1.5 to 2.5 feet below the surface during wet periods.

Most of the acreage of this soil is used as woodland. The rest is used as cropland or pasture.

The crops commonly grown on this soil are corn, soybeans, tobacco, and small grain. The hazard of erosion is the major management concern. Minimum tillage, crop residue management, grassed waterways, and terraces and diversions help to control runoff and erosion. Bermudagrass hybrids are the primary species grown for hay and pasture. Pasture management includes measures that maintain the protective plant cover, which help to control runoff and erosion.

The dominant trees are loblolly pine, longleaf pine, blackgum, and sweetgum. The understory includes post oak, blackjack oak, honeysuckle, flowering dogwood, greenbrier, bluestem, and panicum. No limitations affect timber production.

The slow permeability and the wetness are the major limitations affecting septic tank absorption fields and dwellings. These limitations increase the possibility of failure of absorption areas. Installing a drainage system around the foundations of dwellings helps to remove excess water. Properly designing local roads and streets helps to offset the limited ability of this soil to support a load. Erosion is a hazard when the surface is bare.

The major limitations affecting recreational development are the wetness and the slow permeability. Erosion-control measures and a drainage system are needed in intensively used areas, such as playgrounds.

The land capability subclass is IIIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

GhD—Gilead loamy sand, 8 to 15 percent slopes. This strongly sloping, moderately well drained soil is on short side slopes along drainageways on Coastal Plain uplands. Individual areas are long and narrow and range from 5 to 40 acres in size.

Typically, the surface layer is dark grayish brown loamy sand 8 inches thick. The subsoil extends to a depth of 50 inches. In sequence downward, it is brownish yellow sandy clay loam that has reddish yellow mottles; brownish yellow sandy clay that has yellowish red, reddish yellow, and light gray mottles; mottled brownish yellow, red, light gray, and reddish yellow sandy clay; and mottled light gray, red, light reddish brown, reddish yellow, and brownish yellow sandy clay loam that has pockets of sandy clay. The underlying material to a depth of 80 inches is light brown sandy loam that has light gray, very pale brown, and brownish yellow mottles.

Included with this soil in mapping are small areas of Bibb and Vaucluse soils. The poorly drained Bibb soils are along drainageways. Vaucluse soils are commonly along the upper edges of the mapped areas. Included soils make up about 10 percent of this map unit.

Permeability is slow in the Gilead soil. Available water capacity is moderate. The shrink-swell potential is low. Runoff is rapid. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. The seasonal high water table is 1.5 to 2.5 feet below the surface during wet periods.

Most of the acreage of this soil is used as woodland. A very small acreage is used as cropland. The rest is used as pasture.

The commonly grown crops are corn, soybeans, tobacco, and small grain. This soil is generally unsuited to cultivated crops because of the hazard of erosion. Conservation tillage, crop residue management, grassed waterways, diversions, field borders, and crop rotations help to control runoff and erosion. Bermudagrass hybrids are the primary species grown for hay and pasture. Pasture management includes measures that maintain the protective plant cover, which help to control runoff and erosion.

The dominant trees are loblolly pine, longleaf pine, blackgum, and sweetgum. The understory includes post oak, blackjack oak, honeysuckle, flowering dogwood, and greenbrier. No limitations affect timber production.

The slow permeability and the slope are the major limitations affecting septic tank absorption fields and dwellings with or without basements. These limitations increase the possibility of failure of the absorption areas. Installing a drainage system around the foundations of dwellings helps to remove excess water. Properly designing local roads and streets helps to offset the limited ability of this soil to support a load.

The major limitations affecting recreational development are the slope and the wetness. Erosion-control measures and a drainage system are needed in intensively used areas, such as playgrounds.

The land capability subclass is IVe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

GoC—Goldston very channery silt loam, 2 to 15 percent slopes. This gently sloping to strongly sloping, well drained to excessively drained soil is on ridges and side slopes on Piedmont uplands. Individual areas are oblong and range from 4 to more than 200 acres in size.

Typically, the surface layer is brown very channery silt loam 5 inches thick. The subsoil is light yellowish brown very channery silt loam 7 inches thick. Soft, sericitic schist and slate rock is at a depth of 12 inches. Hard, sericitic schist rock is at a depth of 24 inches.

Included with this soil in mapping are small areas of Lignum and Nason soils. The somewhat poorly drained Lignum soils generally are at the head of drainageways that dissect the map unit. Nason soils are clayey and have soft bedrock within 40 to 60 inches of the surface. Also included are small areas that have slate bedrock at or near the surface and areas that are more than 40 inches deep over hard bedrock. Typically, no more than two or three inclusions are in any mapped area. Included areas make up less than 15 percent of this map unit.

Permeability is moderately rapid in the Goldston soil. Available water capacity is moderate. Runoff is rapid. Reaction is extremely acid to strongly acid, except where the surface layer has been limed. The depth to hard, fractured bedrock ranges from 20 to 40 inches.

Most of the acreage of this soil is used as woodland. A very small acreage is used as cropland or pasture.

The slope, the hazard of erosion, and the depth to bedrock are the major management concerns affecting the production of crops and pasture on this soil.

The dominant trees are loblolly pine, shortleaf pine, Virginia pine, white oak, southern red oak, hickory, red maple, and post oak. The understory includes flowering dogwood, American holly, and laurel. The slope is the major limitation affecting woodland management.

The depth to bedrock and the slope are the major limitations affecting septic tank absorption fields, dwellings, and local roads and streets.

The slope and the depth to bedrock are the major limitations affecting recreational development.

The land capability subclass is IVs. Based on loblolly pine as the indicator species, the woodland ordination symbol is 7D.

GoF—Goldston very channery silt loam, 15 to 45 percent slopes. This moderately steep and steep, well drained to excessively drained soil is on side slopes along the major creeks and rivers on Piedmont uplands. Individual areas are in narrow, roughly rectangular bands and range from 5 to more than 100 acres in size.

Typically, the surface layer is brown very channery silt loam 5 inches thick. The subsoil is light yellowish brown very channery silt loam 7 inches thick. Soft, sericitic schist and slate rock is at a depth of 12 inches. Hard, sericitic schist rock is at a depth of 24 inches.

Included with this soil in mapping are small areas of Nason and Tatum soils. The included soils are clayey and have soft bedrock at a depth of 40 to 60 inches. They are in the less sloping areas. Also included are some areas of rock outcrop and areas of soils that are more than 40 inches deep over hard bedrock. These inclusions are intermingled with areas of the Goldston soil. Included areas make up about 20 percent of this map unit.

Permeability is moderately rapid in the Goldston soil. Available water capacity is moderate. Runoff is rapid. Reaction is extremely acid to strongly acid, except where the surface layer has been limed. The depth to soft bedrock ranges from 10 to 20 inches.

All of the acreage of this soil is used as woodland. The dominant trees are loblolly pine, shortleaf pine, Virginia pine, southern red oak, and white oak. The understory includes flowering dogwood, eastern redcedar, eastern redbud, and American holly. The restricted rooting depth is the major limitation affecting woodland management.

The slope and the depth to bedrock are the major limitations affecting septic tank absorption fields and dwellings with basements. The shallowness of the soil and the fractured rock strata increase the possibility of failure of the absorption areas and the contamination of ground water supplies. The depth to bedrock also is a limitation affecting local roads and streets.

The slope and the depth to bedrock are the major limitations affecting recreational development.

The land capability subclass is VIIs. Based on loblolly pine as the indicator species, the woodland ordination symbol is 7D.

IrB—Iredell clay loam, 2 to 6 percent slopes. This gently sloping, moderately well drained soil is on broad ridges in depressed areas where basic intrusions occur in Piedmont uplands. Individual areas are 5 to 50 acres in size.

Typically, the surface layer is dark grayish brown clay loam 7 inches thick. The subsoil extends to a depth of 25 inches. The upper part is light olive brown clay that has strong brown mottles. The lower part is yellowish brown clay that has strong brown and dark brown mottles. The underlying material extends to a depth of 62 inches. The upper part is yellowish brown sandy clay loam that has yellowish red, strong brown, and dark yellowish brown mottles. The lower part is yellowish brown sandy loam that has yellowish red, dark yellowish brown, and strong brown mottles.

Included with this soil in mapping are small areas of

Georgeville, Mayodan, and Nason soils. The included soils are well drained and moderately permeable and are near slope breaks. Nason soils have bedrock at a depth of 40 to 60 inches. Included soils make up less than 10 percent of this map unit.

Permeability is slow in the Iredell soil. Available water capacity is moderate. The shrink-swell potential is very high. Runoff is medium. Reaction is strongly acid to neutral in the surface layer, except where limed, moderately acid to neutral in the subsoil, and slightly acid to slightly alkaline in the underlying material. A perched seasonal high water table is 1 foot to 2 feet below the surface.

Most of the acreage of this soil is used as woodland. Some areas are used for crops, hay, or pasture.

In cultivated areas, the commonly grown crops are corn, soybeans, and small grain. Tobacco can be grown if surface water is removed by bedding or land smoothing. The slope, the susceptibility to erosion, the wetness, and the slow permeability are management concerns. Surface runoff is the major limitation. Minimum tillage, crop residue management, and cover crops help to control runoff. Because of the slowly permeable subsoil, tillage is restricted after hard rains. Crusting is common on the surface after hard rains, and clods form if these areas are worked during wet periods. The crust and the clods hinder the germination of seeds. Fescue is the primary species grown for hay and pasture. Pasture management includes measures that maintain the protective plant cover, rotation grazing, and grazing only during dry periods.

The dominant trees are loblolly pine, shortleaf pine, white oak, and post oak. The understory includes flowering dogwood, American holly, eastern redcedar, sourwood, and black cherry. The clayey subsoil is the major limitation. Using wheeled and tracked equipment during wet periods results in ruts, surface compaction, and damage to tree roots.

The slow permeability and the wetness are limitations on sites for septic tank absorption fields. Careful site selection, design, and installation are necessary to ensure that the absorption area is large enough. The seasonal high water table must be considered when septic tank absorption fields are designed. The wetness, the slow permeability, and the very high shrink-swell potential are the major limitations affecting dwellings with or without basements. Reinforcing the foundations and installing surface and subsurface drainage systems are necessary to overcome these limitations. Low strength and shrinking and swelling are limitations on sites for local roads and streets. Cutting and filling and using coarse textured base material help to overcome these limitations.

The wetness is the major limitation affecting recreational development. A good drainage system is needed in intensively used areas, such as playgrounds.

The land capability subclass is IIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 6C.

JoA—Johns fine sandy loam, 0 to 2 percent slopes. This nearly level, somewhat poorly drained and moderately well drained soil is on stream terraces along James Creek and the Little River. Individual areas range from 5 to 25 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam 7 inches thick. The subsoil extends to a depth of 26 inches. The upper part is yellowish brown sandy loam. The next part is yellowish brown sandy clay loam that has red mottles. The lower part is yellowish brown sandy loam that has red and light brownish gray mottles. The underlying material to a depth of 60 inches is light gray sand that has brownish yellow and red mottles.

Included with this soil in mapping are small areas of Kalmia, Kenansville, and Pactolus soils. Kalmia and Kenansville soils are well drained. Pactolus soils have sandier layers underlying the surface layer than those of the Johns soil. Also included are areas of a somewhat poorly drained soil that has a thicker sandy surface layer than that of the Johns soil. This soil is intermingled with areas of the Johns soil. Included soils make up about 10 percent of this map unit.

Permeability is moderate in the Johns soil. Available water capacity is moderate. Runoff is slow. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. The seasonal high water table is 1.5 to 3.0 feet below the surface.

Most of the acreage of this soil is used as woodland. A small acreage is used as cropland. This soil also can be used as pasture.

The commonly grown crops are corn, soybeans, and small grain. The wetness is the major limitation. Minimum tillage, cover crops, and grasses and legumes in the cropping system help to maintain tilth and the content of organic matter. Tillage can be delayed in the spring because of the wetness. Open ditches or a subsurface drainage system may be required. The lack of suitable drainage outlets may be a limitation. Pasture management includes measures that maintain the protective plant cover and rotation grazing.

The dominant trees are loblolly pine, sweetgum, water oak, willow oak, and sycamore. The understory includes flowering dogwood, American holly, greenbrier, and common persimmon. The wetness is the major limitation. Site preparation may include bedding, which increases the depth to the water table, and limited use

of heavy equipment during wet periods, which helps to reduce surface compaction.

The wetness is the major limitation affecting septic tank absorption fields and dwellings with or without basements. A subsurface drainage system or open ditches helps to lower the water table around absorption areas and dwellings. The wetness is a limitation on sites for local roads and streets. Open ditches help to lower the seasonal high water table.

The wetness is the major limitation affecting recreational development. A good drainage system is needed in intensively used areas, such as playgrounds.

The land capability subclass is IIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9W.

KaA—Kalmia sandy loam, wet substratum, 0 to 2 percent slopes. This nearly level, well drained soil is on stream terraces along James Creek and the Little River. Individual areas are oblong and range from 10 to 100 acres in size.

Typically, the surface layer is dark grayish brown sandy loam 5 inches thick. The subsurface layer is grayish brown sandy loam 7 inches thick. The subsoil extends to a depth of 37 inches. The upper part is light yellowish brown sandy clay loam that has reddish yellow mottles. The lower part is light yellowish brown sandy clay loam that has reddish yellow and strong brown mottles. The underlying material to a depth of 60 inches is pale yellow sand that has reddish yellow, strong brown, and light gray mottles.

Included with this soil in mapping are small areas of Johns, Kenansville, and Pactolus soils. The somewhat poorly drained and moderately well drained Johns and Pactolus soils are in long, narrow areas on the slightly lower parts of the landscape. Kenansville soils have a sandier subsoil than that of the Kalmia soil. They are intermingled with areas of the Kalmia soil in the slightly higher landscape positions. Also included are areas that are clayey below a depth of 60 inches. They are along the edges of the mapped areas. Included soils make up about 20 percent of this map unit.

Permeability is moderate in the Kalmia soil. Available water capacity is moderate. Runoff is slow. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed.

Most of the acreage of this soil is used as woodland. Small areas are cleared of trees and used for agricultural production.

The commonly grown crops are corn, soybeans, and small grain. No limitations affect agricultural production. Addition of plant nutrients, crop residue management, and the use of cover crops are good management measures.

The dominant trees are loblolly pine, yellow-poplar, sweetgum, and southern red oak. The understory includes flowering dogwood, greenbrier, sourwood, and American holly. No significant limitations affect timber production.

No significant limitations affect septic tank absorption fields, dwellings with or without basements, or local roads and streets.

No significant limitations affect recreational development.

This soil is in land capability class I. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9A.

KeB—Kenansville loamy sand, 0 to 4 percent slopes. This nearly level and gently sloping, well drained soil is on stream terraces along James Creek and the Little River. Individual areas are generally broad or elongated and range from 5 to 50 acres in size.

Typically, the surface layer is dark grayish brown loamy sand 6 inches thick. The subsurface layer is 16 inches of yellowish brown loamy sand that has brownish yellow mottles. The subsoil extends to a depth of 48 inches. The upper part is yellowish brown sandy loam, and the lower part is brownish yellow loamy sand. The underlying material extends to a depth of 80 inches. The upper part is very pale brown sand that has very pale brown mottles. The lower part is light gray sand that has brownish yellow mottles.

Included with this soil in mapping are small areas of Johns, Kalmia, and Pactolus soils. The included soils are in lower positions on the landscape than the Kenansville soil. Johns and Pactolus soils are somewhat poorly drained and moderately well drained. Included soils make up about 15 percent of this map unit.

Permeability is moderately rapid in the Kenansville soil. Available water capacity is low. Runoff is slow. Reaction is very strongly acid to moderately acid, except where the surface layer has been limed.

Most of the acreage of this soil is used as woodland. The rest is used as cropland or pasture.

The commonly grown crops are corn, soybeans, and small grain. Droughtiness, the leaching of plant nutrients, and the hazard of wind erosion are the major management concerns. Winter cover crops, conservation tillage, and crop residue management help to control wind erosion, maintain tilth and the content of organic matter, and conserve moisture. Bermudagrass hybrids are the primary species grown for hay and pasture. Pasture management should include measures that maintain a protective plant cover, which help to control wind erosion and minimize leaching.

The dominant trees are loblolly pine and longleaf

pine. The understory includes sassafras, flowering dogwood, blackgum, and blackjack oak. The loose, sandy layers in the upper 20 to 40 inches hinder the use of wheeled equipment, especially when the soil is saturated or very dry.

No major limitations affect septic tank absorption fields or dwellings with or without basements. Establishing and maintaining lawns and shrubs may be difficult because of the leaching of plant nutrients and droughtiness. Drought-tolerant grasses and shrubs should be selected for planting. No major limitations affect local roads and streets.

The sandy surface layer is the major limitation affecting recreational development. This limitation can be overcome by controlling traffic and maintaining the protective plant cover on this soil.

The land capability subclass is IIs. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8S.

LgB—Lignum silt loam, 2 to 7 percent slopes. This gently sloping, somewhat poorly drained soil is on broad ridges that are dissected by intermittent drainageways. It is on Piedmont uplands. Individual areas are broad and uniform and range from 5 to 500 acres in size.

Typically, the surface layer is grayish brown silt loam 2 inches thick. The subsurface layer is 10 inches of very pale brown silt loam that has reddish yellow mottles. The subsoil extends to a depth of 39 inches. The upper part is yellowish brown silty clay loam that has reddish yellow mottles. The next part is yellowish brown silty clay that has light gray and strong brown mottles. The lower part is light brownish gray silty clay loam that has strong brown mottles. The underlying material to a depth of 56 inches is mottled light gray, strong brown, and white silt loam. Moderately hard bedrock is at a depth of 56 inches.

Included with this soil in mapping are small areas of Goldston and Nason soils. The well drained to excessively drained Goldston soils are in the more sloping areas. The well drained Nason soils are in the slightly higher areas. Also included are small areas of poorly drained soils along drainageways and small areas of soils intermingled with the Lignum soil that are more than 60 inches deep over soft bedrock. Included soils make up about 25 percent of this map unit.

Permeability is slow in the Lignum soil. Available water capacity and the shrink-swell potential are moderate. Runoff is medium. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. The seasonal high water table ranges from 1.0 foot to 2.5 feet below the surface during wet periods.

Most of the acreage of this soil is used as woodland. The rest is used as pasture or cropland.

The commonly grown crops are corn, soybeans, and small grain. The hazard of erosion is the major management concern. Crop residue management, timely planting, and cover crops help to control erosion. Tillage during wet periods results in clods, surface compaction, and the deterioration of tilth. Fescue is the primary species grown for pasture. Pasture management includes measures that maintain the protective plant cover, rotation grazing, and grazing only during dry periods, which help to control runoff, erosion, and compaction.

The dominant trees are loblolly pine, shortleaf pine, southern red oak, yellow-poplar, and red maple. The understory includes American holly, flowering dogwood, blackgum, and greenbrier. A moderate equipment limitation affects timber production.

The slow permeability and the wetness are the major limitations affecting septic tank absorption fields and dwellings with or without basements. The moderately hard bedrock is a limitation in some areas. Careful site selection, design, and installation are necessary to ensure that the absorption areas are large enough. Installing a subsurface drainage system around the foundations of dwellings helps to remove excess water. Low strength is a limitation on sites for local roads and streets. The addition of coarse textured base material, such as sand or gravel, helps to overcome this limitation.

The slow permeability and the wetness are the major limitations affecting recreational development. A good surface and subsurface drainage system should be provided in intensively used areas, such as playgrounds and camp areas.

The land capability subclass is IIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 7W.

LgC—Lignum silt loam, 7 to 12 percent slopes. This gently sloping and strongly sloping, somewhat poorly drained soil is on side slopes and near the head of drainageways on Piedmont uplands. Individual areas are elongated or irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is grayish brown silt loam 2 inches thick. The subsurface layer is 10 inches of very pale brown silt loam that has reddish yellow mottles. The subsoil extends to a depth of 39 inches. The upper part is yellowish brown silty clay loam that has reddish yellow mottles. The next part is yellowish brown silty clay that has light gray and strong brown mottles. The lower part is light brownish gray silty clay loam that has strong brown mottles. The underlying

material to a depth of 56 inches is mottled light gray, strong brown, and white silt loam. Moderately hard bedrock is at a depth of 56 inches.

Included with this soil in mapping are small areas of Goldston and Nason soils. The well drained to excessively drained Goldston soils are in the more sloping areas. The well drained Nason soils are in the slightly higher areas. Also included are small areas of soils that are more than 60 inches deep over soft bedrock. These soils are in the steeper areas. Included soils make up about 15 percent of this map unit.

Permeability is slow in the Lignum soil. Available water capacity and the shrink-swell potential are moderate. Runoff is medium. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. The seasonal high water table ranges from 1.0 foot to 2.5 feet below the surface during wet periods.

Most of the acreage of this soil is used as woodland. The rest is used as pasture or cropland.

The commonly grown crops are corn, soybeans, and small grain. The hazard of erosion is the major management concern. Conservation cropping systems, cover crops, grassed waterways, diversions, terraces, and field borders reduce runoff and control erosion. Tillage during wet periods results in clods, surface compaction, and the deterioration of tilth. Fescue is the primary species grown for pasture. Measures that maintain the protective plant cover and grazing during dry periods help to control erosion and compaction.

The dominant trees are loblolly pine, shortleaf pine, southern red oak, yellow-poplar, and red maple. The understory includes American holly, flowering dogwood, and blackgum. The wetness is a limitation affecting timber production.

The slow permeability, the wetness, and the slope are the major limitations affecting septic tank absorption fields and dwellings with or without basements. The moderately hard bedrock is a limitation in some areas. Careful site selection, design, and installation are necessary to ensure that the absorption areas are large enough to handle the expected effluent load and to ensure that the effluent does not seep to the surface in downslope areas. Installing a drainage system around the foundations of dwellings helps to remove excess water. Low strength is a limitation on sites for local roads and streets. The addition of coarse textured base material, such as sand or gravel, helps to overcome this limitation.

The slow permeability, the slope, and the wetness are the major limitations affecting recreational development. A good surface and subsurface drainage system should be provided in intensively used areas, such as playgrounds and camp areas.

The land capability subclass is IIIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 7W.

MaB—Masada fine sandy loam, 2 to 8 percent slopes. This gently sloping, well drained soil is on high stream terraces on Piedmont uplands. Individual areas are oblong and range from 5 to more than 150 acres in size.

Typically, the surface layer is yellowish brown fine sandy loam 9 inches thick. The subsoil extends to a depth of 45 inches. The upper part is yellowish red clay loam. The next part is red clay that has brownish yellow mottles. The lower part is red clay loam that has strong brown mottles. The underlying material extends to a depth of 60 inches. The upper part is mottled strong brown, red, brownish yellow, and very pale brown sandy clay loam. The lower part is mottled strong brown, red, reddish yellow, and very pale brown gravelly sandy clay loam.

Included with this soil in mapping are small areas of the moderately well drained Tetotum soils, which are intermingled with areas of the Masada soil in long, narrow depressions. These soils make up about 10 percent of this map unit.

Permeability is moderate in the Masada soil. Available water capacity and the shrink-swell potential are moderate. Runoff is medium. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed.

Most of the acreage of this soil is used as cropland. Some areas are used for hay or pasture. A very small acreage is used as woodland.

The crops commonly grown on this soil are corn, soybeans, milo, and small grain. The hazard of erosion is the major management concern affecting agricultural production. Conservation cropping systems, cover crops, grassed waterways, diversions, field borders, contour farming, and crop residue management help to control runoff and erosion and maintain tilth. Fescue is the primary species grown for hay and pasture. Pasture management includes measures that maintain the protective plant cover and rotation grazing, which help to control runoff and erosion.

The dominant trees are loblolly pine, shortleaf pine, yellow-poplar, white oak, hickory, and southern red oak. The understory includes red maple, flowering dogwood, sourwood, eastern redbud, and honeysuckle. No major limitations affect timber production.

The moderate permeability and the moderate shrink-swell potential are limitations affecting septic tank absorption fields and dwellings with or without basements. The limitations on sites for septic tank absorption fields can be overcome by increasing the

size of the absorption area. The limitations on sites for dwellings can be overcome by reinforcing the foundations. Low strength is a limitation on sites for local roads and streets. It can be overcome by adding coarse textured base material, such as sand or gravel.

No major limitations affect recreational development.

The land capability subclass is IIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

MaD—Masada fine sandy loam, 8 to 15 percent slopes. This strongly sloping, well drained soil is on the side slopes of stream terraces in Piedmont uplands. Individual areas are irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is yellowish brown fine sandy loam 9 inches thick. The subsoil extends to a depth of 45 inches. The upper part is yellowish red clay loam. The next part is red clay that has brownish yellow mottles. The lower part is red clay loam that has strong brown mottles. The underlying material extends to a depth of 60 inches. The upper part is mottled strong brown, red, brownish yellow, and very pale brown sandy clay loam. The lower part is mottled strong brown, red, reddish yellow, and very pale brown gravelly sandy clay loam.

Included with this soil in mapping are small areas of the moderately well drained Tetotum soils on toe slopes. These soils make up about 5 percent of this map unit.

Permeability is moderate in the Masada soil. Available water capacity and the shrink-swell potential are moderate. Runoff is rapid. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed.

Most of the acreage of this soil is used as cropland. Some areas are used for hay or pasture. A very small acreage is used as woodland.

The crops commonly grown on this soil are corn, soybeans, milo, and small grain. The slope and the hazard of erosion are the major management concerns. Conservation cropping systems, cover crops, contour farming, stripcropping, terraces, grassed waterways, diversions, field borders, and crop residue management help to control runoff and erosion. Fescue is the primary species grown for hay and pasture. Pasture management includes measures that maintain the protective plant cover and rotation grazing, which help to control runoff and erosion.

The dominant trees are loblolly pine, shortleaf pine, yellow-poplar, southern red oak, white oak, and hickory. The understory includes red maple, flowering dogwood, eastern redbud, and sourwood. The slope and the hazard of erosion are the major management concerns. On roads and skid trails, water turnouts, water bars, or broad-based dips are needed to direct water and sediments into duff layers or filter strips.

The moderate permeability, the moderate shrink-swell potential, and the slope are the major limitations affecting septic tank absorption fields and dwellings with or without basements. The limitations on sites for septic tank absorption fields can be overcome by installing the distribution lines on the contour and by increasing the size of the absorption area. The limitations on sites for dwellings can be overcome by conforming the dwelling to the surrounding landscape, by cutting and filling, and by reinforcing the foundations. Low strength is the major limitation affecting local roads and streets. It can be overcome by adding coarse textured base material, such as sand or gravel.

The slope is the major limitation affecting recreational development. This limitation can be overcome by cutting and filling or by conforming the recreational facilities to the surrounding landscape.

The land capability subclass is IIIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

MdB—Mayodan fine sandy loam, 2 to 8 percent slopes. This gently sloping, well drained soil is on broad ridges on Piedmont uplands. Individual areas generally are irregular in shape and range from 5 to about 300 acres in size.

Typically, the surface layer is brown fine sandy loam 7 inches thick. The subsoil extends to a depth of 51 inches. In sequence downward, it is yellowish red silty clay loam that has strong brown mottles, red clay, reddish brown silty clay loam that has red mottles, and red silty clay loam. Soft bedrock that crushes to fine sandy loam is at a depth of 51 inches.

Included with this soil in mapping are small areas of Creedmoor, Mooshaunee, Hallison, and Pinkston soils. The moderately well drained and somewhat poorly drained Creedmoor, moderately well drained Mooshaunee, and well drained and moderately well drained Hallison soils are in slight depressions. Pinkston soils are along the edges of the mapped areas. Also included are some areas that have a gravelly surface layer. These areas are on uplands along the contact zone between the Piedmont and the Coastal Plain. Included soils make up 25 percent of this map unit.

Permeability is moderate in the Mayodan soil. Available water capacity and the shrink-swell potential are moderate. Runoff is medium. Reaction is very strongly acid to moderately acid, except where the surface layer has been limed.

Most of the acreage of this soil is used as woodland. The rest is used as cropland or pasture.

The crops commonly grown on this soil are corn, soybeans, tobacco, and small grain. The hazard of erosion is the major management concern. Conservation cropping systems, crop residue management, field borders, terraces, grassed waterways, and diversions help to control runoff and erosion. Fescue is the primary species grown for hay and pasture. Pasture management includes measures that maintain the protective plant cover and rotation grazing, which help to control runoff and erosion.

The dominant trees are loblolly pine, shortleaf pine, white oak, southern red oak, yellow-poplar, sweetgum, and hickory. The understory includes flowering dogwood, sourwood, eastern redcedar, common persimmon, American holly, and red maple. No major limitations affect timber production. Limiting the use of equipment during wet periods helps to avoid surface compaction and increases productivity.

The moderate permeability is a limitation on sites for septic tank absorption fields. The permeability and the moderate shrink-swell potential are limitations on sites for dwellings with or without basements. Careful design is needed to ensure that the absorption areas are large enough. Reinforcing the foundations of dwellings helps to overcome shrinking and swelling. Low strength affects the use of this soil as a site for local roads and streets. It can be overcome by using coarse textured base material, such as sand or gravel, to increase strength.

No major limitations affect most recreational development. The slope is a moderate limitation affecting playgrounds.

The land capability subclass is IIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9A.

MdD—Mayodan fine sandy loam, 8 to 15 percent slopes. This strongly sloping, well drained soil is on short side slopes on Piedmont uplands. Individual areas are irregular in shape and range from 5 to about 100 acres in size.

Typically, the surface layer is brown fine sandy loam 7 inches thick. The subsoil extends to a depth of 51 inches. In sequence downward, it is yellowish red silty clay loam that has strong brown mottles, red clay, reddish brown silty clay loam that has red mottles, and red silty clay loam. Soft bedrock that crushes to fine sandy loam is at a depth of 51 inches.

Included with this soil in mapping are small areas of Creedmoor and Pinkston soils. The moderately well drained and somewhat poorly drained Creedmoor soils are in small depressions. Pinkston soils are on the slightly steeper side slopes adjacent to drainageways. Included soils make up about 15 percent of this map unit.

Permeability is moderate in the Mayodan soil. Available water capacity and the shrink-swell potential are moderate. Runoff is rapid. Reaction is very strongly acid to moderately acid, except where the surface layer has been limed.

Most of the acreage of this soil is used as woodland. The rest is used as cropland or pasture.

The crops commonly grown on this soil are corn, soybeans, tobacco, and small grain. The slope and the hazard of erosion are the major management concerns. Conservation cropping systems, grassed waterways, field borders, terraces, diversions, and contour farming help to control runoff and erosion. Fescue is the primary species grown for hay and pasture. Management includes measures that maintain a protective plant cover and rotation grazing, which help to control runoff and erosion.

The dominant trees are loblolly pine, shortleaf pine, white oak, southern red oak, sweetgum, hickory, and yellow-poplar. The understory includes flowering dogwood, American holly, sourwood, common persimmon, and red maple. No major limitations affect timber production, but water turnouts or broad-based dips are needed on roads and skid trails to direct water and sediments into filter strips. Limiting the use of equipment during wet periods helps to avoid surface compaction and increases productivity.

The slope, the moderate permeability, and the moderate shrink-swell potential are limitations on sites for septic tank absorption fields and dwellings with or without basements. The absorption areas should be designed to ensure that they are large enough to handle the expected effluent load and to ensure that the effluent does not seep to the surface in downslope areas. Reinforcing the foundations and cutting and filling help to overcome these limitations for dwellings. Low strength affects the use of this soil as a site for local roads and streets. It can be overcome by using coarse textured base material, such as sand or gravel, to increase strength.

The slope is the major limitation affecting recreational development. It can be overcome by cutting and filling or by conforming the recreational facilities to the surrounding landscape.

The land capability subclass is IVe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9A.

MdE—Mayodan fine sandy loam, 15 to 25 percent slopes. This moderately steep, well drained soil is on side slopes on Piedmont uplands. Individual areas are

irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is brown fine sandy loam 7 inches thick. The subsoil extends to a depth of 51 inches. In sequence downward, it is yellowish red silty clay loam that has strong brown mottles, red clay, reddish brown silty clay loam that has red mottles, and red silty clay loam. Soft bedrock that crushes to fine sandy loam is at a depth of 51 inches.

Included with this soil in mapping are small areas of Pinkston soils that are shallower over bedrock than the Mayodan soil and are intermingled with areas of the Mayodan soil. These soils make up about 20 percent of this map unit.

Permeability is moderate in the Mayodan soil. Available water capacity and the shrink-swell potential are moderate. Runoff is rapid. Reaction is very strongly acid to moderately acid, except where the surface layer has been limed.

Most of the acreage of this soil is used as woodland. A very small acreage is used as pasture.

This soil is generally unsuited to cultivated crops. The major management concerns are the slope and the hazard of erosion. Fescue is the primary species grown for hay and pasture. Pasture management includes measures that maintain an adequate protective plant cover and rotation grazing, which help to control runoff and erosion.

The dominant trees are loblolly pine, shortleaf pine, southern red oak, white oak, hickory, yellow-poplar, and sweetgum. The understory includes flowering dogwood, sourwood, eastern redcedar, American holly, and red maple. The slope and the hazard of erosion are management concerns affecting timber production. On roads and skid trails, water turnouts, water bars, or broad-based dips are needed to direct water and sediments into filter strips. Limiting the use of equipment during wet periods helps to avoid surface compaction and increases productivity.

The moderate permeability and the slope are the major limitations affecting septic tank absorption fields. Careful site selection, design, and installation are necessary to ensure that the absorption areas are large enough to handle the expected effluent load and to ensure that the effluent does not seep to the surface in downslope areas. The slope is a limitation on sites for dwellings with or without basements. Cutting and filling to modify the slope or conforming the dwellings to the landscape helps to overcome this limitation. Low strength and the slope are limitations on sites for local roads and streets. Cutting and filling and using coarse textured base material help to overcome these limitations.

The slope and the hazard of erosion are the major management concerns affecting recreational development. Cutting and filling and maintaining an adequate protective plant cover help to overcome these limitations.

The land capability subclass is VIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9R.

MoB—Mooshaunee-Hallison complex, 2 to 8 percent slopes. These gently sloping soils are on narrow to broad ridgetops on Piedmont uplands in the central and northeastern parts of the county. The Mooshaunee soil is moderately well drained, and the Hallison soil is well drained and moderately well drained. Individual areas are irregular in shape and range from 5 to more than 300 acres in size. They are about 50 percent Mooshaunee soil and 35 percent Hallison soil. The two soils occur as areas so intricately mixed that mapping them separately was not practical at the scale selected for mapping.

Typically, the Mooshaunee soil has a surface layer of yellowish brown silt loam 3 inches thick. The subsurface layer is very pale brown silt loam 7 inches thick. The subsoil extends to a depth of 37 inches. In sequence downward, it is brownish yellow silty clay loam that has very pale brown mottles; yellowish brown silty clay loam that has pale brown mottles; strong brown silty clay loam that has light gray and reddish brown mottles; and reddish brown silty clay loam that has light gray mottles. Soft siltstone that crushes to silt loam is at a depth of 37 inches.

Typically, the Hallison soil has a surface layer of brown silt loam 7 inches thick. The subsurface layer is pale brown loam 4 inches thick. The subsoil extends to a depth of 48 inches. In sequence downward, it is yellowish brown silty clay loam, strong brown silty clay loam, strong brown silty clay loam that has reddish brown mottles, strong brown silty clay loam that has very pale brown mottles, and dark reddish brown silty clay loam that has light gray, brown, and yellow mottles. Soft siltstone that crushes to silt loam is at a depth of 48 inches.

Included with these soils in mapping are small areas of Creedmoor and Pinkston soils. The moderately well drained and somewhat poorly drained Creedmoor soils are in slight depressions. The well drained to excessively drained Pinkston soils are on slope breaks around the edge of the mapped areas. Also included are scattered areas of soils that are similar to the Mooshaunee soil but are well drained and soils that are similar to the Hallison soil but are moderately well drained. Included soils make up about 15 percent of this map unit.

Permeability is moderately slow in the Mooshaunee soil. Available water capacity is moderate. Runoff is

medium. The hazard of erosion is moderate if the soil is unprotected. Reaction is extremely acid to strongly acid, except where the surface layer has been limed. The seasonal high water table is 1.5 to 3.0 feet below the surface for brief periods. Soft bedrock is 20 to 40 inches below the surface.

Permeability is moderately slow in the Hallison soil. Available water capacity is moderate. Runoff is medium. The hazard of erosion is moderate in areas where the soil is bare. Reaction is extremely acid to strongly acid, except where the surface layer has been limed. The seasonal high water table is 2.5 to 4.0 feet below the surface for brief periods. Soft bedrock is 40 to 60 inches below the surface.

Most of the acreage in this map unit is used as woodland. A very small acreage is used as cropland or pasture.

The commonly grown crops are corn, soybeans, small grain, and tobacco. The slope, surface runoff, and the hazard of erosion are the major management concerns. Crop rotations, contour farming, conservation tillage, grassed waterways, diversions, and field borders help to control runoff and erosion. Fescue is the primary species grown for hay and pasture. Management should include measures that maintain a protective plant cover and thus control runoff and erosion.

The dominant trees are loblolly pine, shortleaf pine, white oak, and southern red oak. The understory includes red maple, American holly, flowering dogwood, and blueberry. The seasonal wetness can be a limitation affecting woodland management. Using wheeled and tracked equipment during wet periods results in ruts, surface compaction, and damage to tree roots.

The wetness, the moderately slow permeability, and the depth to soft bedrock are the major limitations affecting septic tank absorption fields and dwellings with basements. Properly installed drainage systems around foundations and around absorption fields reduce the wetness. Properly designing local roads and streets helps to offset the limited ability of the soils to support a load.

The wetness is the major limitation affecting recreational development. A good drainage system is needed in intensively used areas, such as playgrounds.

The land capability subclass is IIe in areas of the Mooshaunee soil and IIIe in areas of the Hallison soil. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8D in areas of the Mooshaunee soil and 10A in areas of the Hallison soil.

MoD—Mooshaunee-Hallison complex, 8 to 15 percent slopes. These strongly sloping soils are mainly on the moderately deep side slopes on Piedmont uplands in the central and northeastern parts of the county. The Mooshaunee soil is moderately well drained, and the Hallison soil is well drained and moderately well drained. Individual areas are irregular in shape or long and narrow and range from 10 to 200 acres in size. They are about 45 percent Mooshaunee soil and 35 percent Hallison soil. The two soils occur as areas so intricately mixed that mapping them separately was not practical at the scale selected for mapping.

Typically, the Mooshaunee soil has a surface layer of yellowish brown silt loam 3 inches thick. The subsurface layer is very pale brown silt loam 7 inches thick. The subsoil extends to a depth of 37 inches. In sequence downward, it is brownish yellow silty clay loam that has very pale brown mottles; yellowish brown silty clay loam that has pale brown mottles; strong brown silty clay loam that has light gray and reddish brown mottles; and reddish brown silty clay loam that has light gray mottles. Soft siltstone that crushes to silt loam is at a depth of 37 inches.

Typically, the Hallison soil has a surface layer of brown silt loam 7 inches thick. The subsurface layer is pale brown loam 4 inches thick. The subsoil extends to a depth of 48 inches. In sequence downward, it is yellowish brown silty clay loam, strong brown silty clay loam, strong brown silty clay loam that has reddish brown mottles, strong brown silty clay loam that has very pale brown mottles, and dark reddish brown silty clay loam that has light gray, brown, and yellow mottles. Soft siltstone that crushes to silt loam is at a depth of 48 inches.

Included with these soils in mapping are small areas of the well drained to excessively drained Pinkston soils on slope breaks. Also included are scattered areas of soils that are similar to the Mooshaunee soil but are well drained and soils that are similar to the Hallison soil but are moderately well drained. Included soils make up about 20 percent of this map unit.

Permeability is moderately slow in the Mooshaunee soil. Available water capacity is moderate. Runoff is rapid. The hazard of erosion is severe if the soil is unprotected. Reaction is extremely acid to strongly acid, except where the surface layer has been limed. The seasonal high water table is 1.5 to 3.0 feet below the surface for brief periods. Soft bedrock is 20 to 40 inches below the surface.

Permeability is moderately slow in the Hallison soil. Available water capacity is moderate. Runoff is rapid. The hazard of erosion is severe if the soil is unprotected. Reaction is extremely acid to strongly acid, except where the surface layer has been limed. The seasonal high water table is 2.5 to 4.0 feet below the surface for brief periods. Soft bedrock is 40 to 60 inches below the surface.

Most of the acreage in this map unit is used as woodland. A very small acreage is used as cropland or pasture.

The commonly grown crops are corn, soybeans, small grain, and tobacco. The slope, surface runoff, and the hazard of erosion are the major management concerns. Contour farming, crop rotations, conservation tillage, grassed waterways, diversions, and field borders help to control runoff and erosion. Fescue is the primary species grown for hay and pasture. Management should include measures that maintain a protective plant cover and thus control runoff and erosion.

The dominant trees are loblolly pine, shortleaf pine, white oak, and southern red oak. The understory includes red maple, American holly, flowering dogwood, and blueberry. The seasonal wetness can be a limitation affecting woodland management. Using wheeled and tracked equipment during wet periods results in ruts, surface compaction, and damage to tree roots.

The wetness, the slope, and the depth to soft bedrock are the major limitations affecting septic tank absorption fields and dwellings with basements. Properly installed drainage systems around foundations and distribution lines installed on the contour help to overcome these limitations. Properly designing local roads and streets helps to offset the limited ability of the soils to support a load.

The wetness and the slope are the major limitations affecting recreational development. A good drainage system is needed in intensively used areas, such as playgrounds.

The land capability subclass is IIIe in areas of the Mooshaunee soil and IVe in areas of the Hallison soil. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8D in areas of the Mooshaunee soil and 10A in areas of the Hallison soil.

MoE—Mooshaunee-Hallison complex, 15 to 25 percent slopes. These moderately steep soils are on side slopes on Piedmont uplands in the central and northeastern parts of the county. The Mooshaunee soil is moderately well drained, and the Hallison soil is well drained and moderately well drained. Individual areas are irregular in shape and range from 5 to 100 acres in size. They are about 40 percent Mooshaunee soil and 35 percent Hallison soil. The two soils occur as areas so intricately mixed that mapping them separately was not practical at the scale selected for mapping.

Typically, the Mooshaunee soil has a surface layer of yellowish brown silt loam 3 inches thick. The subsurface layer is very pale brown silt loam 7 inches thick. The subsoil extends to a depth of 37 inches. In sequence downward, it is brownish yellow silty clay loam that has very pale brown mottles; yellowish brown silty clay loam that has pale brown mottles; strong brown silty clay loam that has light gray and reddish brown mottles; and reddish brown silty clay loam that has light gray mottles. Soft siltstone that crushes to silt loam is at a depth of 37 inches.

Typically, the Hallison soil has a surface layer of brown silt loam 7 inches thick. The subsurface layer is pale brown loam 4 inches thick. The subsoil extends to a depth of 48 inches. In sequence downward, it is yellowish brown silty clay loam, strong brown silty clay loam, strong brown silty clay loam that has reddish brown mottles, strong brown silty clay loam that has very pale brown mottles, and dark reddish brown silty clay loam that has light gray, brown, and yellow mottles. Soft siltstone that crushes to silt loam is at a depth of 48 inches.

Included with these soils in mapping are small areas of the well drained to excessively drained Pinkston soils in convex areas. Also included are scattered areas of soils that are similar to the Mooshaunee soil but are well drained and soils that are similar to the Hallison soil but are moderately well drained. Included soils make up about 25 percent of this map unit.

Permeability is moderately slow in the Mooshaunee soil. Available water capacity is moderate. Runoff is rapid. Reaction is extremely acid to strongly acid, except where the surface layer has been limed. The seasonal high water table is 1.5 to 3.0 feet below the surface for brief periods. Soft bedrock is 20 to 40 inches below the surface.

Permeability is moderately slow in the Hallison soil. Available water capacity is moderate. Runoff is rapid. Reaction is extremely acid to strongly acid, except where the surface layer has been limed. The seasonal high water table is 2.5 to 4.0 feet below the surface for brief periods. Soft bedrock is 40 to 60 inches below the surface.

Most of the acreage in this map unit is used as woodland. A very small acreage is used as pasture.

These soils are generally unsuited to cultivation. Fescue is the primary species grown for hay and pasture. Management should include measures that maintain a protective plant cover and thus control runoff and erosion.

The dominant trees are loblolly pine, shortleaf pine, white oak, and southern red oak. The understory includes red maple, American holly, flowering dogwood, and blueberry. The slope and the wetness are the major limitations. Using wheeled and tracked equipment during wet periods results in ruts, surface compaction, and damage to tree roots.

The wetness, the moderately slow permeability, the slope, and the depth to bedrock are the major

limitations affecting septic tank absorption fields. Careful site selection, design, and installation are necessary to ensure that the absorption field is large enough to handle the expected effluent load and to ensure that the effluent does not seep to the surface in downslope areas. The seasonal high water table must be considered when septic tank absorption fields are designed. The slope is a limitation on sites for dwellings without basements. The slope and the wetness are limitations on sites for dwellings with basements. Cutting and filling or conforming the dwellings to the landscape helps to overcome the slope limitation. Properly installed drainage systems around the foundations helps to reduce the wetness. Low strength and the slope are limitations on sites for local roads and streets. Cutting and filling and using coarse textured base material help to overcome these limitations.

The seasonal wetness, the slope, and the hazard of erosion are the major management concerns affecting recreational development.

The land capability subclass is VIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8R in areas of the Mooshaunee soil and 10R in areas of the Hallison soil.

NaB—Nason silt loam, 2 to 8 percent slopes. This gently sloping, well drained soil is on Piedmont uplands in the northwestern part of the county. Individual areas are irregular in shape and range from 5 to about 300 acres in size.

Typically, the surface layer is yellowish brown silt loam 10 inches thick. The subsoil extends to a depth of 47 inches. The upper part is strong brown silty clay loam that has yellowish red mottles. The next part is strong brown silty clay loam that has brownish yellow and red mottles. The lower part is mottled strong brown, red, brownish yellow, light gray, and light bluish gray silt loam. Soft bedrock that crushes to silt loam is at a depth of 47 inches.

Included with this soil in mapping are small areas of Lignum and Tatum soils. The somewhat poorly drained Lignum soils are at the head of drainageways and in depressions. Tatum soils generally are intermingled with areas of the Nason soil in the slightly higher areas. Included soils make up about 25 percent of this map unit.

Permeability is moderate in the Nason soil. Available water capacity and the shrink-swell potential are moderate. Runoff is medium. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. The depth to soft bedrock is 40 to more than 60 inches.

Most of the acreage of this soil is used as woodland. The rest is used as cropland or pasture.

The commonly grown crops are corn, soybeans, milo, and small grain. The hazard of erosion is the major management concern. Conservation cropping systems, grassed waterways, crop residue management, diversions, field borders, and a cropping system that includes close-growing crops help to conserve soil and water. Fescue is the primary species grown for hay and pasture. Pasture management includes measures that maintain the protective plant cover, which help to control runoff and erosion.

The dominant trees are loblolly pine, shortleaf pine, white oak, hickory, southern red oak, and red maple. The understory includes American holly, flowering dogwood, blackgum, eastern redcedar, sourwood, and greenbrier. No major limitations affect woodland management.

The moderate permeability and the depth to bedrock are limitations affecting septic tank absorption fields. Careful site selection, design, and installation and adequate soil material between the bottom of the trench and the bedrock are necessary to ensure that the absorption field is large enough to handle the expected effluent load. The moderate shrink-swell potential is a limitation for dwellings with or without basements. Care is needed when foundations are designed to ensure that they can withstand the shrinking and swelling of the soil. Low strength is the major limitation affecting local roads and streets. It can be overcome by adding coarse textured base material, such as sand or gravel.

No major limitations affect recreational development.

The land capability subclass is IIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

NaD—Nason silt loam, 8 to 15 percent slopes. This strongly sloping, well drained soil is on side slopes on Piedmont uplands. Individual areas are oblong and narrow and range from 5 to 100 acres in size.

Typically, the surface layer is yellowish brown silt loam 10 inches thick. The subsoil extends to a depth of 47 inches. The upper part is strong brown silty clay loam that has yellowish red mottles. The next part is strong brown silty clay loam that has brownish yellow and red mottles. The lower part is mottled strong brown, red, brownish yellow, light gray, and light bluish gray silt loam. Soft bedrock that crushes to silt loam is at a depth of 47 inches.

Included with this soil in mapping are small areas of Goldston and Tatum soils. Goldston soils are shallower than the Nason soil. They are in the steeper areas. Tatum soils generally are intermingled with areas of the Nason soil throughout the map unit. Also included are small areas of soils that are more than 60 inches deep over bedrock. They are intermingled with areas of the

Nason soil. Included soils make up about 25 percent of this map unit.

Permeability is moderate in the Nason soil. Available water capacity and the shrink-swell potential are moderate. Runoff is medium or rapid. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. The depth to soft bedrock ranges from 40 to 60 inches.

Most of the acreage of this soil is used as woodland. The rest is used as cropland or pasture.

The commonly grown crops are corn, soybeans, milo, and small grain. The hazard of erosion, the slope, and surface runoff are the major management concerns. Conservation cropping systems, grassed waterways, terraces, field borders, diversions, and a cropping system that includes close-growing crops help to conserve soil and water. Fescue is the primary species grown for hay and pasture. Pasture management includes measures that maintain the protective plant cover, which help to control runoff and erosion.

The dominant trees are loblolly pine, shortleaf pine, white oak, southern red oak, red maple, and hickory. The understory includes American holly, flowering dogwood, sourwood, eastern redcedar, and blackgum. No major limitations affect timber production, but water turnouts or broad-based dips are needed on roads and skid trails to direct water and sediments into duff layers and filter strips.

The slope, the moderate permeability, and the depth to bedrock are limitations on sites for septic tank absorption fields. Careful site selection, design, and installation and adequate soil material between the bottom of the trench and the bedrock are necessary to ensure that the system is large enough to handle the expected effluent load and that the effluent does not seep out in downslope areas. The moderate shrink-swell potential is a limitation for dwellings with or without basements. Care is needed when foundations are designed to ensure that they can withstand the shrinking and swelling of the soil. Low strength is a limitation on sites for local roads and streets. It can be overcome by adding coarse textured base material, such as sand or gravel.

The slope is the major limitation affecting recreational development. It can be overcome by cutting and filling or by conforming the facilities to the surrounding landscape.

The land capability subclass is IIIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8A.

PaA—Pactolus sand, 0 to 3 percent slopes. This nearly level and gently sloping, moderately well drained and somewhat poorly drained soil is on terraces along James Creek and the Little River. Individual areas are oblong and range from 5 to about 60 acres in size.

Typically, the surface layer is grayish brown sand 4 inches thick. The underlying material extends to a depth of 80 inches. The upper part is brownish yellow sand that has brownish yellow mottles. The next part is brownish yellow sand that has light gray and very pale brown mottles. The lower part is light yellowish brown sand that has light gray mottles.

Included with this soil in mapping are small areas of Johns and Kenansville soils. The somewhat poorly drained and moderately well drained Johns soils are in the slightly lower areas. The well drained Kenansville soils generally are in the slightly higher areas. Included soils make up about 10 percent of this map unit.

Permeability is rapid in the Pactolus soil. Available water capacity is low. Runoff is slow. Reaction is extremely acid to strongly acid, except where the surface layer has been limed. The seasonal high water table is 1.5 to 3.0 feet below the surface during wet periods.

Most of the acreage of this soil is used as woodland. Small areas have been cleared of trees and are used as cropland.

The commonly grown crops are corn, soybeans, and small grain. The leaching of plant nutrients and the low available water capacity during the growing season are the main limitations. Minimum tillage, crop residue management, and the use of cover crops minimize leaching and help to conserve moisture.

The dominant trees are loblolly pine, sweetgum, water oak, willow oak, and red maple. The understory includes greenbrier, blueberry, black cherry, and sassafras. The seasonal wetness is a limitation affecting timber production. The use of heavy equipment should be avoided when the soil is too wet or too dry.

The rapid permeability and the seasonal high water table are limitations on sites for septic tank absorption fields. The seasonal high water table can be controlled by installing a drainage system around the absorption area. Because of the droughtiness during the summer, establishing and maintaining lawns and shrubs may be difficult. Drought-tolerant species should be selected for planting. No limitations affect local roads and streets.

The wetness is the major limitation affecting recreational development. A good drainage system is needed in intensively used areas, such as playgrounds.

The land capability subclass is IIIs. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9S.

PkD—Pinkston silt loam, 8 to 15 percent slopes. This strongly sloping, well drained to excessively

drained soil is on side slopes along Little Governors Creek, Governors Creek, and McIntosh Creek in the northeastern part of the county. Individual areas are long and irregular in width. They range from 5 to about 200 acres in size.

Typically, the surface layer is dark brown silt loam 6 inches thick. The subsoil extends to a depth of 31 inches. The upper part is brown fine sandy loam, and the lower part is reddish brown sandy loam. The underlying material to a depth of 36 inches is dark reddish gray very fine sandy loam that has reddish brown and strong brown mottles. Hard mudstone and conglomerate bedrock is at a depth of 36 inches.

Included with this soil in mapping are small areas of Mayodan soils, which are commonly in the higher areas. Also included are small areas of Mooshaunee and Hallison soils on benches adjacent to the steeper side slopes. Included soils make up about 15 percent of this map unit.

Permeability is moderately rapid in the Pinkston soil. Available water capacity is low. Runoff is medium. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. The depth to hard bedrock ranges from 20 to 40 inches.

Most of the acreage of this soil is used as woodland. A small acreage is used as pasture.

The slope, the hazard of erosion, and the depth to bedrock are management concerns affecting cropland. Grassed waterways, field borders, diversions, conservation cropping systems, and cover crops help to control runoff and erosion. Fescue is the primary species grown for hay and pasture. Pasture management includes measures that maintain the protective plant cover and rotation grazing, which help to control runoff and erosion.

The dominant trees are loblolly pine, shortleaf pine, southern red oak, hickory, white oak, and American beech. The understory includes flowering dogwood, sourwood, eastern redcedar, and black cherry. The restricted rooting depth is a limitation affecting timber production.

The slope, the depth to bedrock, and seepage are the major limitations affecting septic tank absorption fields. Careful site selection, design, and installation and adequate soil material between the bottom of the trench and the bedrock are necessary to ensure proper treatment of the effluent and to ensure that the effluent does not seep out in downslope areas. The slope and the depth to bedrock are limitations on sites for dwellings with or without basements. The slope can be overcome by cutting and filling or by conforming the dwellings to the surrounding landscape. Heavy equipment may be needed to make excavations for foundations or basements. The slope and the depth to bedrock are the major limitations on sites for local roads and streets. Cutting and filling and using heavy equipment are necessary to overcome these limitations.

The slope is a limitation affecting recreational development. It can be overcome by cutting and filling or by conforming the recreational facilities to the surrounding landscape.

The land capability subclass is IVe. Based on southern red oak as the indicator species, the woodland ordination symbol is 3D.

PkF—Pinkston silt loam, 15 to 40 percent slopes. This moderately steep and steep, well drained to excessively drained soil is on side slopes along Little Governors Creek, Governors Creek, and McIntosh Creek in the northeastern part of the county. Individual areas are long and narrow and range from 5 to 75 acres in size.

Typically, the surface layer is dark brown silt loam 6 inches thick. The subsoil extends to a depth of 31 inches. The upper part is brown fine sandy loam, and the lower part is reddish brown sandy loam. The underlying material to a depth of 36 inches is dark reddish gray very fine sandy loam that has reddish brown and strong brown mottles. Hard mudstone and conglomerate bedrock is at a depth of 36 inches.

Included with this soil in mapping are small areas of Mayodan soils, which are commonly in the higher areas and around the edges of the mapped areas. Also included are Mooshaunee and Hallison soils on benches and in depressions. Included soils make up about 10 percent of this map unit.

Permeability is moderately rapid in the Pinkston soil. Available water capacity is low. Runoff is rapid. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. The depth to hard bedrock ranges from 20 to 40 inches.

All of the acreage of this soil is used as woodland. The dominant trees are loblolly pine, shortleaf pine, white oak, southern red oak, hickory, and American beech. The understory includes flowering dogwood, eastern redcedar, red maple, and black cherry. The slope, the restricted rooting depth, and the hazard of erosion are management concerns affecting timber production. The slope restricts the use of wheeled and tracked equipment on skid trails. A cable yarding system generally is safer and results in less damage to the soil. The use of wheeled and tracked equipment increases the hazard of erosion and can reduce productivity.

The slope and the depth to bedrock are limitations on sites for septic tank absorption fields and dwellings with or without basements. Careful site selection, design, and installation and adequate soil material between the

bottom of the trench and the bedrock are necessary to ensure that the effluent does not seep out in downslope areas. Foundations for dwellings may have to be excavated by heavy equipment, and the dwellings should be designed so that they conform to the surrounding landscape. The slope is the major limitation affecting local roads and streets. Cutting and filling can overcome this limitation.

The slope is a limitation affecting recreational development. It can be overcome by cutting and filling or by conforming the recreational facilities to the surrounding landscape.

The land capability subclass is VIIe. Based on southern red oak as the indicator species, the woodland ordination symbol is 3D.

Pt—Pits, quarry. This map unit occurs as areas where the original soil material, gravel, or rock has been removed. These areas are open excavations as much as 100 feet or more deep. Plants generally do not grow well in these areas, except in unexposed soil around the outer edge of the mapped areas. Some pine trees and native grasses have become established in the small areas of exposed soil.

The land capability subclass is VIIIs. This map unit is not assigned a woodland ordination symbol.

TnE—Tatum and Nason channery silt loams, 15 to 25 percent slopes. These moderately steep, well drained soils are on side slopes on Piedmont uplands in the northwestern part of the county. Typically, they are about 45 percent Tatum soil and 35 percent Nason soil. The map unit occurs as areas of Tatum and Nason soils that are not always adjacent to each other. In each mapped area at least one of the soils is present, and in some mapped areas both soils are present. Because these soils respond similarly to most kinds of use and management, they were not separated in mapping. Individual areas are long and narrow and range from 5 to 100 acres in size.

Typically, the Tatum soil has a surface layer of strong brown channery silt loam 5 inches thick. The subsoil extends to a depth of 43 inches. The upper part is red silty clay that has reddish yellow mottles. The lower part is red silty clay loam that has reddish yellow mottles. Soft bedrock that crushes to silt loam is at a depth of 43 inches.

Typically, the Nason soil has a surface layer of yellowish brown silt loam 10 inches thick. The subsoil extends to a depth of 47 inches. The upper part is strong brown silty clay loam that has yellowish red mottles. The next part is strong brown silty clay loam that has brownish yellow and red mottles. The lower part is mottled strong brown, red, brownish yellow, light gray, and light bluish gray silt loam. Soft bedrock that crushes to silt loam is at a depth of 47 inches.

Included with these soils in mapping are small areas of Goldston soils in the more convex areas. Also included are small areas of soils that are more than 60 inches deep over soft bedrock. These soils are intermingled with areas of the Tatum and Nason soils. Included soils make up about 20 percent of this map unit.

Permeability is moderate in the Tatum and Nason soils. Available water capacity and the shrink-swell potential are moderate. Runoff is medium or rapid. The hazard of erosion is moderate where the surface is bare. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. The depth to soft bedrock is 40 to 60 inches below the surface.

Most of the acreage in this map unit is used as woodland. A few areas are used as pasture.

These soils are not presently used as cropland. If these soils are to be used as cropland, the slope and the hazard of erosion are the major management concerns. Conservation cropping systems, grassed waterways, terraces, field borders, diversions, and close-growing cover crops help to control runoff and erosion. Fescue is the primary species grown for pasture and hay. Pasture management includes rotation grazing and measures that maintain the protective plant cover, which help to control runoff and erosion.

The dominant trees are loblolly pine, shortleaf pine, yellow-poplar, white oak, southern red oak, hickory, and sweetgum. The understory includes flowering dogwood, greenbrier, American holly, eastern redcedar, red maple, and blackgum. The hazard of erosion and the slope are management concerns affecting timber production. On roads and skid trails, water bars or broad-based dips are needed to direct water into duff layers or filter strips.

The moderate permeability, the slope, and the depth to bedrock are limitations on sites for septic tank absorption fields. Careful site selection, design, and installation and adequate soil material between the bottom of the trench and the bedrock are necessary to ensure that the absorption areas are large enough to handle the expected effluent load and to ensure that the effluent does not seep to the surface in downslope areas. The slope and shrinking and swelling are limitations on sites for dwellings with or without basements. Cutting and filling and reinforcing the foundations help to overcome these limitations. The slope and low strength are limitations on sites for local roads and streets. Cutting and filling and adding coarse textured base material, such as sand or gravel, help to overcome these limitations.

The slope is the major limitation affecting recreational development. Cutting and filling help to overcome this limitation.

The land capability subclass is IVe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 6R in areas of the Tatum soil and 8R in areas of the Nason soil.

ToA—Tetotum silt loam, 0 to 3 percent slopes, rarely flooded. This nearly level and gently sloping, moderately well drained soil is on stream terraces throughout the county. Individual areas are irregular in shape and range from 5 to 100 acres in size.

Typically, the surface layer is brown silt loam 4 inches thick. The subsurface layer is brownish yellow silt loam 5 inches thick. The subsoil extends to a depth of 44 inches. It is silty clay loam. The upper part is brownish yellow. The next part is yellowish brown and has red, strong brown, and brown mottles. The lower part is strong brown and has pinkish gray mottles. The underlying material to a depth of 70 inches is yellowish red silt loam that has red, pinkish gray, and light reddish brown mottles.

Included with this soil in mapping are small areas of Chewacla and Masada soils. The somewhat poorly drained Chewacla soils are along drainageways. The well drained Masada soils are in the higher positions on the landscape. Also included are wet spots, which are identified by a special symbol on the soil maps. Included soils make up about 10 percent of this map unit.

Permeability is moderate in the Tetotum soil. Available water capacity is high. Runoff is slow. Reaction is extremely acid to strongly acid, except where the surface layer has been limed. The seasonal high water table is 1.5 to 2.5 feet below the surface. The soil is subject to rare flooding of brief duration during periods of abnormally high floods.

About half of the acreage of this soil is used as cropland or pasture. The rest is used as woodland.

The commonly grown crops are corn, soybeans, and small grain. The wetness is the major limitation. A drainage system may be needed for some agricultural crops. Fescue is the primary species grown for hay and pasture. Proper stocking rates, rotation grazing, timely deferment of grazing, and restricted use during wet periods help to keep the pasture in good condition.

The dominant trees are loblolly pine, yellow-poplar, sweetgum, southern red oak, and white oak. The understory includes American holly, sourwood, flowering dogwood, greenbrier, winged elm, and red maple. Plant competition and the hazard of flooding are management concerns affecting timber production. Disking during site preparation helps to control plant competition. Using wheeled and tracked equipment during wet periods results in ruts, surface compaction, and damage to tree roots.

The wetness is a limitation affecting recreational development. A good drainage system is needed in intensively used areas, such as playgrounds.

The land capability subclass is IIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9W.

Ud—Udorthents, loamy. This map unit consists of sand pits, landfill, borrow pits, and fill. In these areas the natural layering sequence of the soil has been so altered by earthmoving operations, such as scraping, backfilling, trenching, and excavating, that identification of the natural soil is not feasible. These areas are identified on the soil maps by the map unit symbol and by the following special symbols—Sand Pit, Landfill or LF, Borrow Pit or BP, and Fill.

Sand pits are on Coastal Plain uplands in the southern part of the county. They include open excavations from which sand has been or is being removed for use in construction. In many places sand pits are in areas of Candor soils and, to a minor extent, Ailey soils.

These areas have short, vertical sidewalls and a relatively smooth base. They range from 3 to about 30 feet deep. The depth depends on the thickness of the sandy layer. Typically, the sand pits vary in shape and size. The largest ranges up to about 175 acres in size. The exposed loamy soil material supports plant growth. The rooting depth and the low available water capacity are limitations of the soil material.

The natural areas are commonly reseeded to loblolly pine, turkey oak, and blackjack oak. Reclaimed areas are in coastal bermudagrass and loblolly pine.

These areas have the potential for urban uses, recreational development, or wildlife habitat.

The Moore County landfill is on Coastal Plain uplands and in the Sandhills in the southern part of the county. It consists of graded trenches that are backfilled with alternate layers of solid refuse and soil material. A final cover of about 2 feet of soil is on the surface. After the final cover is added, the surface is nearly level and gently sloping.

Included in mapping are small areas of undisturbed soil, which are commonly near the edge of the mapped areas. The soil between the trenches is relatively undisturbed, except for the final cover used to smooth the entire area.

Areas of landfill are suited to plant growth. Available water capacity is generally low. A permanent plant cover is essential to protect these areas from erosion.

The characteristics of the soil material vary to such a

degree that interpretive statements cannot be made without onsite examinations of the individual areas.

Areas of borrow pits are scattered throughout the county, commonly adjacent to the major roads. They consist of areas from which the soil material has been removed for use as construction material for highways. The cuts are 5 to more than 15 feet deep. The base slope in these cuts is level and gently sloping. Most cuts have one or more short, nearly vertical side slopes. The soil material presently exposed is commonly similar to that in the subsoil and the underlying material of the closely adjacent soils. Loamy marine deposits are the most common material exposed in the cuts. Areas of less than 2 acres in size are shown by a spot symbol on the soil maps.

Included in mapping are small areas of fill material that have been pushed aside during excavation. Some of the borrow pits have been reclaimed and are seeded to grasses. A few areas are naturally reseeded to wild grasses, weeds, and loblolly pine. Because of the shallow rooting depth, the low available water capacity, the low content of organic matter, and poor soil fertility, these areas have poor physical properties for establishing and supporting plant growth.

Seeded areas have the potential for use as wildlife habitat.

Fill areas are in the southern part of the county, near lakes and drainageways. Most of these areas are used for golf courses. They are generally long, narrow strips of soil material used to raise the landscape above the normal flood stage. Available water capacity is generally moderate, and these areas have a permanent plant cover.

The land capability subclass is VIIIs. This map unit is not assigned a woodland ordination symbol.

Ur—Urban land. This map unit consists of areas where more than 85 percent of the surface is covered by buildings, streets, and parking lots. Extensive urbanization has altered the natural soils and has changed the topography and original landscape. The remaining soil surfaces are used mainly for small lawns or shrub gardens near buildings, sidewalks, and parking areas. The slope is commonly 2 to 8 percent.

Most areas are in or around the towns of Southern Pines, Aberdeen, and Pinehurst. Individual areas are irregular in shape and range from 5 to 80 acres in size. Other areas in the smaller towns in the county range from 5 to 25 acres in size.

Nearly all of the precipitation that falls in this map unit runs off, increasing the hazard of flooding in low areas. Silt from areas that have been graded and have not been stabilized can be carried into waterways and reservoirs.

Onsite examination is necessary to determine the use and management in this map unit.

The land capability subclass is VIIIs. This map unit is not assigned a woodland ordination symbol.

VaB—Vaucluse loamy sand, 2 to 8 percent slopes. This gently sloping, well drained soil is on ridgetops throughout the Coastal Plain. Individual areas are elongated or irregular in shape and range from 5 to about 200 acres in size.

Typically, the surface layer is brown loamy sand 7 inches thick. The subsurface layer is yellowish brown loamy sand 6 inches thick. The subsoil extends to a depth of 50 inches. The upper part is moderately permeable, firm, strong brown sandy clay loam that has yellowish red mottles. The lower part is slowly permeable, very firm, reddish yellow sandy clay loam that has yellowish red mottles. The underlying material extends to a depth of 80 inches. The upper part is mottled very pale brown and reddish yellow sandy loam, and the lower part is very pale brown fine sand.

Included with this soil in mapping are small areas of Ailey, Dothan, Fuquay, and Gilead soils. Ailey, Dothan, and Fuquay soils are commonly in the smooth, less sloping areas. The moderately well drained Gilead soils are on the lower part of the slope along drainageways. Also included are wet spots, which are identified by a special symbol on the soil maps. Included soils make up about 20 percent of this map unit.

Permeability is slow in the Vaucluse soil. Available water capacity is low. Runoff is medium. Reaction is very strongly acid or strongly acid in the surface layer and subsurface layer, except where limed, and extremely acid to strongly acid in the subsoil and underlying material.

About one-third of the acreage of this soil is used as cropland. The rest is used as pasture or woodland.

The crops commonly grown on this soil are corn, tobacco, soybeans, and small grain. The hazard of erosion is the major management concern. Conservation cropping systems, cover crops, grassed waterways, diversions, field borders, and crop residue management help to control erosion. Bermudagrass hybrids are the primary species grown for hay and pasture. Pasture management includes measures that maintain the protective plant cover, which help to control erosion. Proper stocking rates, rotation grazing, and restricted use during wet periods help to keep the pasture in good condition.

The dominant trees are loblolly pine, longleaf pine, white oak, and southern red oak. The understory includes flowering dogwood, greenbrier, pineland threeawn, and sourwood. No major limitations affect

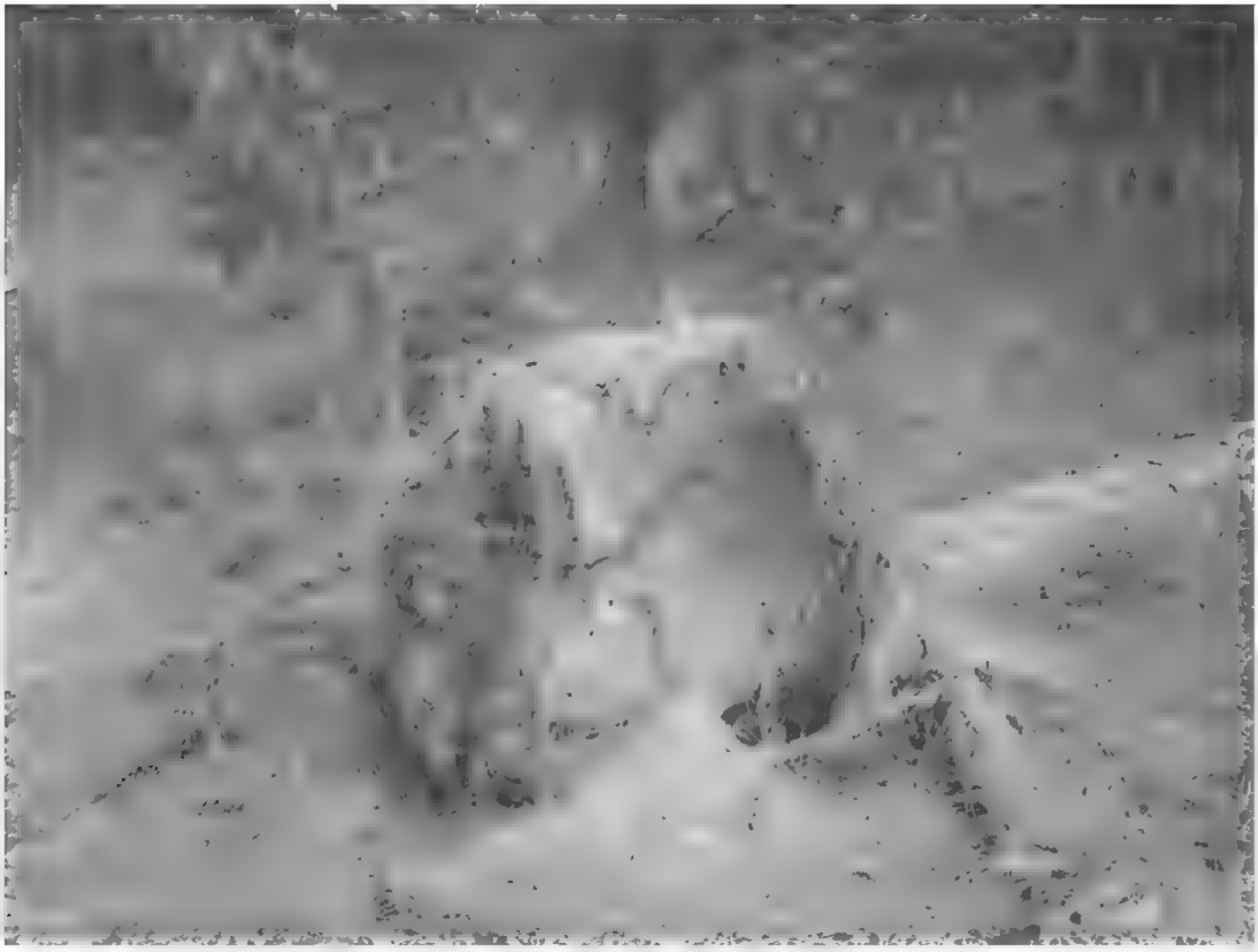


Figure 5.—Because of the high content of sand, trees on Vaucluse loamy sand, 2 to 8 percent slopes, are subject to windthrow during periods of high winds.

timber production, but periods of high winds result in a windthrow hazard (fig. 5).

The slow permeability is the major limitation affecting septic tank absorption fields. Careful site selection, design, and installation are necessary to ensure that the absorption areas are large enough to handle the expected effluent load. No major limitations affect dwellings with or without basements or local roads and streets.

The slow permeability is a limitation affecting recreational development. Excess water should be directed into filter strips.

The land capability subclass is IIIs. Based on loblolly pine as the indicator species, the woodland ordination symbol is 7A.

VaD—Vaucluse loamy sand, 8 to 15 percent slopes. This strongly sloping, well drained soil is on side slopes throughout the Coastal Plain. Individual areas are narrow and irregular in shape and range from 5 to about 100 acres in size.

Typically, the surface layer is brown loamy sand 7 inches thick. The subsurface layer is yellowish brown loamy sand 6 inches thick. The subsoil extends to a depth of 50 inches. The upper part is moderately permeable, firm, strong brown sandy clay loam that has

yellowish red mottles. The lower part is slowly permeable, very firm, reddish yellow sandy clay loam that has yellowish red mottles. The underlying material extends to a depth of 80 inches. The upper part is mottled very pale brown and reddish yellow sandy loam, and the lower part is very pale brown fine sand.

Included with this soil in mapping are small areas of Ailey, Bibb, and Gilead soils. Ailey soils are in the higher areas. They have a thicker surface layer than that of the Vaucluse soil. The poorly drained Bibb soils are along drainageways. The moderately well drained Gilead soils are at the head of drainageways, on toe slopes, and along drainageways. Also included are wet spots, which are identified by a special symbol on the soil maps. Included soils make up about 15 percent of this map unit.

Permeability is slow in the Vaucluse soil. Available water capacity is low. Runoff is medium. Reaction is very strongly acid or strongly acid in the surface layer and subsurface layer, except where limed, and extremely acid to strongly acid in the subsoil and underlying material.

Most of the acreage of this soil is used as woodland. The rest is used for hay, pasture, or cropland.

The crops commonly grown on this soil are corn, tobacco, small grain, and soybeans. The hazard of erosion, runoff, and the slope are the major management concerns. Conservation cropping systems, crop residue management, terraces, grassed waterways, field borders, and diversions help to control runoff and erosion. Bermudagrass hybrids are the primary species grown for hay and pasture. Pasture management includes measures that maintain the protective plant cover, which help to control runoff and erosion. Proper stocking rates, rotation grazing, and restricted use during wet periods help to keep the pasture in good condition.

The dominant trees are loblolly pine, longleaf pine, white oak, and southern red oak. The understory includes flowering dogwood, sourwood, greenbrier, and common persimmon. No major limitations affect timber production, but periods of high winds result in a windthrow hazard.

The slow permeability and the slope are the major limitations affecting septic tank absorption fields and dwellings with or without basements. Careful site selection, design, and installation are necessary to ensure that the absorption areas are large enough. Cutting and filling or conforming the dwellings to the surrounding landscape helps to overcome the slope. The slope is a limitation on sites for local roads and streets. It can be overcome by cutting and filling.

The slope is a limitation affecting recreational development. Cutting and filling help to overcome this limitation.

The land capability subclass is IVe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 7A.

VaE—Vaucluse loamy sand, 15 to 25 percent slopes. This moderately steep, well drained soil is on side slopes along the major drainageways and streams throughout the Coastal Plain uplands. Individual areas are narrow and irregular in shape and range from 5 to 50 acres in size.

Typically, the surface layer is brown loamy sand 7 inches thick. The subsurface layer is yellowish brown loamy sand 6 inches thick. The subsoil extends to a depth of 50 inches. The upper part is moderately permeable, firm, strong brown sandy clay loam that has yellowish red mottles. The lower part is slowly permeable, very firm, reddish yellow sandy clay loam that has yellowish red mottles. The underlying material extends to a depth of 80 inches. The upper part is mottled very pale brown and reddish yellow sandy loam, and the lower part is very pale brown fine sand.

Included with this soil in mapping are small areas of Ailey, Bibb, and Gilead soils. Ailey soils are in the less sloping areas. The poorly drained Bibb soils are along drainageways. The moderately well drained Gilead soils are on toe slopes and in seepage areas next to the drainageways. Included soils make up about 10 percent of this map unit.

Permeability is slow in the Vaucluse soil. Available water capacity is low. Runoff is rapid. Reaction is very strongly acid or strongly acid in the surface layer and subsurface layer, except where limed, and extremely acid to strongly acid in the subsoil and underlying material.

Most of the acreage of this soil is used as woodland. A small acreage is used as pasture.

This soil is generally not suited to cultivated crops because of the slope and the hazard of erosion. Bermudagrass hybrids are the primary species grown for hay and pasture. Pasture management includes measures that maintain the protective plant cover, which help to control runoff and erosion.

The dominant trees are loblolly pine, longleaf pine, white oak, and southern red oak. The understory includes flowering dogwood, sourwood, and greenbrier. The slope is a limitation affecting timber production. Care is needed in selecting equipment. This soil is susceptible to windthrow damage during periods of high winds.

The slow permeability and the slope are the major limitations affecting septic tank absorption fields. Careful site selection, design, and installation are

necessary to ensure that the absorption areas are large enough to handle the expected effluent load and to ensure that the effluent does not seep to the surface in downslope areas. The slope is the major limitation on sites for dwellings with or without basements. It can be overcome by cutting and filling or by conforming the dwellings to the surrounding landscape. The slope is the major limitation affecting local roads and streets. Cutting and filling can overcome this limitation.

The slope is a limitation affecting recreational development. Cutting and filling can overcome this limitation.

The land capability subclass is VIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 7A.

VcB—Vaucluse gravelly sandy loam, 2 to 8 percent slopes. This gently sloping, well drained soil is on ridgetops on Coastal Plain uplands in and around Carthage and on uplands along the contact zone between the Coastal Plain and the Piedmont. Individual areas are elongated or irregular in shape and range from 5 to 100 acres in size.

Typically, the surface layer is brown gravelly sandy loam 10 inches thick. The subsoil extends to a depth of 46 inches. The upper part is very firm, yellowish brown sandy clay loam. The lower part is yellowish brown gravelly sandy clay loam that has red and brownish yellow mottles and dense, brittle zones. The underlying material to a depth of 60 inches is yellowish brown very gravelly loam that has red and brownish yellow mottles and some dense, brittle zones.

Included with this soil in mapping are small areas of Ailey, Dothan, and Fuquay soils. Ailey soils are in the slightly higher positions on the landscape. Dothan and Fuquay soils are intermingled with areas of the Vaucluse soil. These soils do not have a gravelly surface layer. Included soils make up about 25 percent of this map unit.

Permeability is moderately slow in the upper part of the subsoil in the Vaucluse soil and slow in the lower part. Available water capacity is moderate. Runoff is medium. Reaction is very strongly acid or strongly acid in the surface layer, except where limed, and extremely acid to strongly acid in the subsoil and underlying material.

Most of the acreage of this soil is used as woodland. The rest is used as cropland or pasture.

The commonly grown crops are corn, tobacco, soybeans, and small grain. The hazard of erosion and the gravelly surface layer are the major management concerns. The gravelly surface layer helps to control the hazard of erosion. Crop residue management, grassed waterways, field borders, diversions, and conservation cropping systems help to control runoff and erosion. Pebbles on the surface are limitations affecting the use of certain types of equipment and seedbed preparation. The gravelly surface layer can inhibit the germination of seeds and reduce the plant population. Bermudagrass hybrids are primarily used for hay and pasture. Proper stocking rates and rotation grazing help to keep the pasture in good condition.

The dominant trees are loblolly pine, shortleaf pine, white oak, and southern red oak. The understory includes flowering dogwood, sourwood, and pineland threeawn. No major limitations affect timber production, but this soil is susceptible to windthrow damage during periods of high winds.

The slow permeability is the major limitation affecting septic tank absorption fields. Careful design and installation are necessary to ensure the absorption areas are large enough. No major limitations affect dwellings with or without basements or local roads and streets.

The gravelly surface layer is a limitation affecting recreational development.

The land capability subclass is IIIs. Based on loblolly pine as the indicator species, the woodland ordination symbol is 7A.

VcD—Vaucluse gravelly sandy loam, 8 to 15 percent slopes. This strongly sloping, well drained soil is on side slopes in the uplands along the contact zone between the Coastal Plain and the Piedmont. Individual areas are narrow and irregular in shape and range from 5 to 100 acres in size.

Typically, the surface layer is brown gravelly sandy loam 10 inches thick. The subsoil extends to a depth of 46 inches. The upper part is very firm, yellowish brown sandy clay loam. The lower part is yellowish brown gravelly sandy clay loam that has red and brownish yellow mottles and dense, brittle zones. The underlying material to a depth of 60 inches is yellowish brown very gravelly loam that has red and brownish yellow mottles and some dense, brittle zones.

Included with this soil in mapping are small areas of Ailey and Bibb soils. Ailey soils have more sand than the Vaucluse soil. They occur in scattered areas. The poorly drained Bibb soils are along drainageways. Included soils make up about 10 percent of this map unit.

Permeability is moderately slow in the upper part of the subsoil in the Vaucluse soil and slow in the lower part. Available water capacity is moderate. Runoff is medium. Reaction is very strongly acid or strongly acid in the surface layer, except where limed, and extremely acid to strongly acid in the subsoil and underlying material.

Most of the acreage of this soil is used as woodland, hayland, or pasture. A very small acreage is used as cropland.

The commonly grown crops are corn, soybeans, tobacco, and small grain. The slope, the hazard of erosion, and the gravelly surface layer are the major management concerns. Grassed waterways, field borders, conservation cropping systems, and diversions help to control runoff and erosion. Bermudagrass hybrids are the primary species grown for hay and pasture. Proper stocking rates and rotation grazing help to keep the pasture in good condition.

The dominant trees are loblolly pine, shortleaf pine, white oak, southern red oak, and sweetgum. The understory includes flowering dogwood, American holly, and sourwood. No major limitations affect timber production, but this soil is susceptible to windthrow damage during periods of high winds.

The slow permeability and the slope are the major limitations affecting septic tank absorption fields. Careful site selection, design, and installation are necessary to ensure the absorption areas are large enough to handle the expected effluent load and to ensure the effluent does not seep to the surface in downslope areas. The slope is a limitation on sites for dwellings with or without basements and local roads and streets. It can be overcome by cutting and filling.

The slope and the gravelly surface layer are limitations affecting recreational development. Cutting and filling help to overcome this limitation.

The land capability subclass is IVe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 7A.

VcE—Vaucluse gravelly sandy loam, 15 to 25 percent slopes. This moderately steep, well drained soil is on side slopes along the major drainageways in the uplands along the contact zone between the Coastal Plain and the Piedmont. Individual areas are narrow and irregular in shape and range from 5 to about 25 acres in size.

Typically, the surface layer is brown gravelly sandy loam 10 inches thick. The subsoil extends to a depth of 46 inches. The upper part is very firm, yellowish brown sandy clay loam. The lower part is yellowish brown gravelly sandy clay loam that has red and brownish yellow mottles and dense, brittle zones. The underlying material to a depth of 60 inches is yellowish brown very gravelly loam that has red and brownish yellow mottles and some dense, brittle zones.

Included with this soil in mapping are small areas of Ailey and Bibb soils. Ailey soils have more sand than the Vaucluse soil. They occur in scattered areas. The poorly drained Bibb soils are along drainageways. Also included are small areas that have a surface layer of loamy sand. Included soils make up about 10 percent of this map unit.

Permeability is moderately slow in the upper part of the subsoil in the Vaucluse soil and slow in the lower part. Available water capacity is moderate. Runoff is medium. Reaction is very strongly acid or strongly acid in the surface layer, except where limed, and extremely acid to strongly acid in the subsoil and underlying material.

Most of the acreage of this soil is used as woodland. The rest is used as pasture.

This soil is generally unsuited to cultivated crops because of the slope. Bermudagrass hybrids are the primary species grown for hay and pasture. Proper stocking rates and rotation grazing help to keep the pasture in good condition.

The dominant trees are loblolly pine, shortleaf pine, white oak, and southern red oak. The understory includes flowering dogwood, sourwood, and red maple. No major limitations affect timber production, but care is needed when wheeled or tracked equipment is operated on some of the steeper slopes.

The slow permeability and the slope are the major limitations affecting septic tank absorption fields. Careful site selection, design, and installation are necessary to ensure that the absorption areas are large enough to handle the expected effluent load and to ensure that the effluent does not seep to the surface in downslope areas. The slope is the major limitation on sites for dwellings with or without basements. Cutting and filling and designing the dwellings so that they conform to the surrounding landscape help to overcome this limitation. The slope is the major limitation affecting local roads and streets. Cutting and filling can overcome this limitation.

The slope and the gravelly surface layer are the major limitations affecting recreational development. Cutting and filling can overcome this limitation.

The land capability subclass is VIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 7A.

VuB—Vaucluse-Urban land complex, 2 to 8 percent slopes. This map unit occurs as areas of a gently sloping, well drained Vaucluse soil intermingled with areas of Urban land. It is about 60 percent Vaucluse soil and 30 percent Urban land. The undisturbed areas of the Vaucluse soil and the Urban land occur in such an intricate pattern that mapping them separately was not practical. This complex is in and around the towns and suburban developments in the Sandhills. Individual areas are long and narrow and range from 25 to 80 acres in size.

The surface layer of the Vaucluse soil is brown loamy sand 7 inches thick. The subsurface layer is yellowish brown loamy sand 6 inches thick. The subsoil extends to a depth of 50 inches. The upper part is moderately permeable, firm, strong brown sandy clay loam that has yellowish red mottles. The lower part is slowly permeable, very firm, reddish yellow sandy clay loam that has yellowish red mottles. The underlying material extends to a depth of 80 inches. The upper part is mottled very pale brown and reddish yellow sandy loam, and the lower part is very pale brown fine sand.

Urban land consists of areas covered by concrete, asphalt, buildings, or other structures.

Included in mapping are areas of Ailey, Candor, and Gilead soils. Ailey and Candor soils are in the slightly higher positions on the landscape. The moderately well drained Gilead soils are on toe slopes along drainageways. Also included are areas of soils that have been altered by urbanization. Included soils make up about 10 percent of this map unit.

Permeability is moderately slow in the upper part of the subsoil in the Vaucluse soil and slow in the lower part. Available water capacity is moderate in this soil. Runoff is medium in the Vaucluse soil. It is high on the Urban land because of the structures covering the soils. Reaction is very strongly acid or strongly acid in the surface layer and subsurface layer, except where limed, and extremely acid to strongly acid in the subsoil and underlying material.

The Vaucluse soil is used for building sites, lawns and gardens, golf courses, bridle paths, trees and shrubs, and public recreational areas. The slow permeability is the major limitation affecting septic tank absorption fields. Careful site selection, design, and installation are necessary to ensure that the absorption areas are large enough.

The land capability subclass is IIIs in areas of the Vaucluse soil and VIIIs in areas of Urban land. This map unit is not assigned a woodland ordination symbol.

VuD—Vaucluse-Urban land complex, 8 to 15 percent slopes. This map unit occurs as areas of a strongly sloping, well drained Vaucluse soil intermingled with areas of Urban land. It is about 60 percent Vaucluse soil and 30 percent Urban land. The undisturbed areas of the Vaucluse soil and the Urban land occur in such an intricate pattern that mapping them separately was not practical. This complex is in and around the towns and suburban developments in the Sandhills. Individual areas are elongated and narrow and range from 10 to 50 acres in size.

The surface layer of the Vaucluse soil is brown loamy sand 7 inches thick. The subsurface layer is yellowish brown loamy sand 6 inches thick. The subsoil extends to a depth of 50 inches. The upper part is moderately permeable, firm, strong brown sandy clay loam that has yellowish red mottles. The lower part is slowly permeable, very firm, reddish yellow sandy clay loam that has yellowish red mottles. The underlying material extends to a depth of 80 inches. The upper part is mottled very pale brown and reddish yellow sandy loam, and the lower part is very pale brown fine sand.

Urban land consists of areas covered by concrete, asphalt, buildings, or other structures.

Included in mapping are areas of Ailey, Bibb, and Gilead soils. Ailey soils are in the slightly higher positions on the landscape. The poorly drained Bibb soils are along drainageways. The moderately well drained Gilead soils are at the head of drainageways, on toe slopes, and along drainageways. Also included are areas of soils that have been altered by urbanization. Included soils make up about 10 percent of this map unit.

Permeability is moderately slow in the upper part of the subsoil in the Vaucluse soil and slow in the lower part. Available water capacity is moderate in this soil. Runoff is medium in the Vaucluse soil. It is high on the Urban land because of the structures covering the soils. Reaction is very strongly acid or strongly acid in the surface layer and subsurface layer, except where limed, and extremely acid to strongly acid in the subsoil and underlying material.

The Vaucluse soil is used for building sites, lawns, golf courses, bridle paths, trees and shrubs, and recreational purposes. The slow permeability and the slope are the major limitations affecting septic tank absorption fields and dwellings with or without basements. Careful site selection, design, and installation are necessary to ensure that the absorption areas are large enough. Cutting and filling can help to overcome the slope limitation on sites for dwellings.

The land capability subclass is IVe in areas of the Vaucluse soil and VIIIs in areas of Urban land. This map unit is not assigned a woodland ordination symbol.

We—Wehadkee loam, 0 to 2 percent slopes, frequently flooded. This nearly level, poorly drained soil is on flood plains throughout the county. Individual areas are generally long and narrow and range from 5 to more than 100 acres in size, but some areas extend for a considerable distance along the streams that flow across the Coastal Plain and range up to several hundred acres in size.

Typically, the surface layer is grayish brown loam 6 inches thick. The subsoil extends to a depth of 52 inches. The upper part is grayish brown silt loam that has strong brown and yellowish red mottles. The lower part is light brownish gray sandy clay loam that has

strong brown and yellowish red mottles. The underlying material to a depth of 62 inches is light gray sandy loam that has brownish yellow mottles.

Included with this soil in mapping are small areas of Chewacla and Congaree soils. The somewhat poorly drained Chewacla soils are in the lower areas between the Congaree soils and the Wehadkee soil. The well drained and moderately well drained Congaree soils commonly are adjacent to streams. Included soils make up about 15 percent of this map unit.

Permeability is moderate in the Wehadkee soil. Available water capacity is high. Runoff is very slow. Reaction ranges from very strongly acid to slightly acid, except where the surface layer has been limed. The seasonal high water table is at the surface or within a depth of 1 foot. This soil is frequently flooded for brief to long periods.

Most of the acreage of this soil is used as woodland. A small acreage is used as pasture. A few areas that have a drainage system are used as cropland.

The commonly grown crops are corn, soybeans, and small grain. The seasonal high water table and the flooding are the major limitations. A drainage system, such as ditches or tile drainage, is needed to obtain optimum crop production. Fescue is the primary species grown for hay and pasture. Proper stocking rates, rotation grazing, and grazing during dry periods are necessary to keep the pasture in good condition.

The dominant trees are sweetgum, yellow-poplar, water oak, American beech, river birch, and willow oak. The understory includes greenbrier, common reed, and winged elm. The major limitations are the seasonal high water table and the flooding. These limitations restrict the use of equipment and increase the seedling mortality rate. Site preparation should include bedding, which increases the depth to the water table, or installing a drainage system, which improves tree growth, facilitates the use of equipment, and reduces the extent of the damage to the soil caused by forestry activities.

The wetness and the flooding are the major limitations affecting septic tank absorption fields and dwellings with or without basements. A better suited soil should be selected as a site for dwellings because of the potential for damage from floodwaters. The wetness and the flooding on sites for local roads and streets can be overcome by constructing the roads above flood stage and by providing culverts to drain the floodwaters.

The wetness and the flooding are the major limitations affecting recreational development. A better suited soil should be selected as a site for recreational facilities.

The land capability subclass is IVw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 11W.

Prime Farmland

In this section, prime farmland is defined and the soils in Moore County that are considered prime farmland are listed.

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, State, and Federal levels, as well as individuals, must encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to food, feed, forage, fiber, and oilseed crops. Such soils have properties that favor the economic production of sustained high yields of crops. The soils need only to be treated and managed by acceptable farming methods. The moisture supply must be adequate, and the growing season must be sufficiently long. Prime farmland soils produce the highest yields with minimal expenditure of energy and economic resources. Farming these soils results in the least damage to the environment.

Prime farmland soils may presently be used as cropland, pasture, or woodland or for other purposes. They are used for food or fiber or are available for these uses. Urban or built-up land, public land, and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land 10 acres or more in size that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water-control structures. Public land is land not available for farming in National forests, National parks, military reservations, and State parks.

Prime farmland soils usually receive an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not frequently flooded during the growing season. The slope ranges mainly from 0 to 8 percent.

The following map units are considered prime farmland in Moore County. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 4. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

Some soils that have a high water table and all soils that are frequently flooded during the growing season qualify as prime farmland only in areas where these limitations have been overcome by drainage measures or flood control. If applicable, the need for these measures is indicated in parentheses after the map unit name in the following list. Onsite evaluation is necessary to determine whether or not limitations have been overcome by corrective measures.

The soils identified as prime farmland in Moore County are:

Ch	Chewacla silt loam, 0 to 2 percent slopes, frequently flooded (where drained and protected from flooding or not frequently flooded during the growing season)
Co	Congaree loam, 0 to 2 percent slopes, frequently flooded (where protected or not frequently flooded during the growing season)
CrB	Creedmoor fine sandy loam, 2 to 6 percent slopes
DoA	Dothan loamy sand, 0 to 2 percent slopes
DoB	Dothan loamy sand, 2 to 6 percent slopes
GeB	Georgeville gravelly silt loam, 2 to 8 percent slopes
GhB	Gilead loamy sand, 2 to 8 percent slopes
JoA	Johns fine sandy loam, 0 to 2 percent slopes (where drained)
KaA	Kalmia sandy loam, wet substratum, 0 to 2 percent slopes
LgB	Lignum silt loam, 2 to 7 percent slopes

MaB	Masada fine sandy loam, 2 to 8 percent slopes
MdB	Mayodan fine sandy loam, 2 to 8 percent slopes
ToA	Tetotum silt loam, 0 to 3 percent slopes, rarely flooded

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help to prevent construction failures caused by unfavorable soil properties.

Generally, the soils in Moore County that are well suited to crops also are well suited to urban uses. The data concerning specific soils in the county can be used in planning future land use patterns. The potential for farming should be considered relative to any soil limitations and the potential for nonfarm development.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern that is in harmony with nature.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

Jacob Crandall, district conservationist, and Bobby G. Brock, conservation agronomist, Natural Resources Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils are identified; the system of land capability classification used by the Natural Resources Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units" and in the tables. Specific information can be obtained from the local office of the Natural Resources Conservation Service or the North Carolina Cooperative Extension Service.

In 1992, about 33,933 acres in Moore County was used for crops and pasture. Of this total, about 15,937 acres was used as harvested cropland, including 1,717 acres for corn, 2,823 acres for tobacco, 2,963 acres for soybeans, and 1,139 acres for wheat. About 15,807 acres was used as pasture, including land used only as pasture or grazing land and areas where pasture is part of a cropland and pasture rotation *(16)*.

Cropland Management

Erosion is a management concern affecting about 65 percent of the cropland in Moore County. It is more severe in areas that have a slope of more than 2 percent, including areas of Creedmoor, Dothan, Fuquay, Georgeville, Gilead, Mayodan, and Nason soils.

Erosion is costly for various reasons. Productivity decreases and tilth deteriorates as the surface layer is eroded away. Costly herbicides, fertilizers, and lime are carried out of the field. Social and environmental costs increase if the eroded materials are deposited into streams, lakes, and reservoirs. Effective control of erosion increases agricultural productivity, minimizes the cost of maintaining water quality, and protects the

quality of both surface water and ground water.

Erosion control systems provide surface cover, help to control runoff and wind erosion, and increase the rate of water infiltration. Maintaining plant cover, such as winter cover crops of small grain, on the soil for extended periods also helps to control erosion.

Terraces and diversions help to control erosion by intercepting excess surface runoff and safely routing water to suitable outlets, such as grassed waterways, which are generally planted to tall fescue or to bahiagrass in the deeper sands. Field borders help divert sediment-laden runoff. These conservation measures are practical and highly effective on soils that have a uniform slope. Examples are Creedmoor, Dothan, Fuquay, Georgeville, Mayodan, and Nason soils.

Contour tillage and stripcropping are effective conservation measures on many of the soils in the county. These measures are most effective on the more uniform slopes but can be adapted to a wide range of slope patterns. A system of conservation tillage, such as minimum, reduced, and no-till, is effective in controlling wind erosion and water erosion.

In many areas of Georgeville, Mayodan, Creedmoor, Vaucluse, and Nason soils, the slope is so short and irregular that contour tillage and parallel terraces are difficult to install. In these areas, the use of effective conservation cropping systems that leave a substantial plant cover is imperative to control erosion.

Information on the design and applicability of an effective resource management system for erosion control on each type of soil can be obtained from the local office of the Natural Resources Conservation Service.

A compacted traffic pan may form between the surface layer and subsoil in some soils in the county. A traffic pan reduces the rate of water infiltration, limits root penetration, and reduces permeability. It increases the hazard of erosion on sloping soils. The occurrence and severity of a traffic pan in these soils increase with the number of trips across the field per crop season. Systems of conservation tillage using rippers, subsoilers, and chisels are effective in breaking up the traffic pan. Rotations of bahiagrass help to reduce traffic pans in Ailey, Candor, Creedmoor, Dothan, Fuquay, Georgeville, Mayodan, and Nason soils.

Droughtiness is often a problem in soils that have a sandy surface layer, such as Ailey, Candor, and Fuquay soils. The sandy surface layer of these soils is very low in content of organic matter, has a low available water capacity, and has high leaching of available plant nutrients. In the county, a large percentage of the tobacco, corn, soybeans, and small grain are grown in areas of these soils. Conservation tillage, crop residue management, and cover crops help to hold soil moisture and return organic matter to the soil and thus reduce droughtiness. A good system of irrigation management also reduces droughtiness.

Wind erosion is often a hazard in areas of droughty soils that have a sandy surface layer. Many tons of topsoil are lost from these soils each year in the county. Damage from wind erosion can be greatly reduced by using a conservation cropping system that includes conservation tillage, cover crops, and crop residue management. Field windbreaks and narrow strips of small grain may be used to reduce wind damage and damage to young plants from blowing sand.

Tetotum, Gilead, Creedmoor, and Chewacla soils require a drainage system. A combination of a surface drainage system, tile drainage, and land smoothing may be needed to obtain optimum crop production. A wide variety of crops, such as corn, soybeans, small grains, truck crops, and forage, can be grown on these soils.

Other soils, such as Bibb and Wehadkee soils, are naturally wet because they are on low flood plains. These soils are difficult to drain because they do not have suitable outlets. The frequent flooding poses an additional hazard in the design and maintenance of a drainage system.

Tilth is an important factor affecting crop production. The germination of seeds and water infiltration are highly influenced by tilth. Soils that have good tilth have a granular, porous surface layer.

The surface layer of most of the soils in the county is loamy sand, sandy loam, or fine sandy loam and is low in content of organic matter. Soils that have a finer textured surface layer of silt loam, such as Georgeville, Nason, and Creedmoor soils, tend to crust when the surface is exposed to intense rainfall. Additions of crop residue and manure to the soil, a cropping system that includes grasses, cover crops, and reduced tillage minimize crusting and improve soil structure and the general tilth.

Because of crusting after rains in the winter, fall plowing is generally not recommended on eroded soils or on soils that have a surface layer of very fine sandy loam or silt loam. The crust that forms is almost impervious to water, and the rate of runoff and erosion increases during the winter and spring. Many of the soils that are plowed in the fall are nearly as hard and dense at planting time as they were before they were plowed. Crusting also reduces the yields of many crops and greatly reduces the rate of water infiltration during the growing season.

Pasture Management

Pasture and hayland acreages in Moore County are almost equally planted in bermudagrass hybrids and tall

fescue. Most bermudagrass hybrids are used as hay. Soils that have a sandy surface layer, such as Ailey, Candor, and Fuquay soils, are frequently used as pasture or hayland. Soil test recommendations are needed for the initial establishment of bermudagrass hybrids. Maintaining nitrogen, phosphorus, and potassium levels are essential to profitable production. Applications of nitrogen require special attention because each cutting of hay removes significant amounts of nitrogen from the soil. Low levels of trace elements limit the growth of plants in older stands of bermudagrass hybrids.

Tall fescue is the predominant pasture grass on soils that have a clayey subsoil, such as Mayodan, Creedmoor, Georgeville, Nason, and Masada soils in the Piedmont area of the county. A soil test is needed as a guide to determine fertilizer and liming needs if tall fescue or fescue-clover pastures are established. Only 1 to 2 tons of lime need to be applied to pastures every 3 to 5 years. Because tall fescue grows mainly in the spring and fall, split applications of nitrogen fertilizer in February and again in September generally are recommended for best results. Tall fescue should not be grazed shorter than 3 inches during the summer. Rotation grazing is an effective management practice.

Alfalfa is rapidly becoming an important hay crop in the county. Maintaining a balanced soil fertility program is essential if alfalfa is grown. Application rates for lime and fertilizer should be based on standard soil tests. Care is needed in choosing the most productive soils. Masada, Georgeville, and Mayodan soils are best suited to alfalfa. Other soils that are suited to alfalfa but are less productive are Creedmoor and Nason soils. Irrigation increases the yields of alfalfa on all of the soils in most years.

Chemical Weed Control

The use of herbicides for weed control is a common practice on the cropland in Moore County. It decreases the need for tillage and is an integral part of modern farming. Selected soil properties, such as organic matter content and texture of the surface layer, affect the rate of herbicide application. Estimates of both of these properties were determined for the soils in the county. Table 14 shows a general range of organic matter content in the surface layer of the soils. The texture of the surface layer is shown in the USDA texture column in table 13.

In some areas the organic matter content projected for the different soils is outside the range shown in the table. The content can be higher in soils that have received high amounts of animal or manmade waste. Soils that have recently been brought into cultivation may have a higher organic matter content in the surface layer than similar soils that have been cultivated for a long time. Conservation tillage can increase the organic matter content in the surface layer. A lower organic matter content is common where the surface layer has been partly or completely removed by erosion or land smoothing. Current soil tests should be used for specific organic matter determinations.

Soil Fertility

The soils in Moore County generally are low in natural fertility. They are naturally acid. Additions of lime and fertilizer are needed for the production of most kinds of crops.

Liming requirements are a major concern on cropland. The acidity level in the soil affects the availability of many nutrients to plants and the activity of beneficial bacteria. Lime also neutralizes exchangeable aluminum in the soil and thus counteracts the adverse effects high levels of aluminum have on many crops. Liming adds calcium (from calcitic lime) or calcium and magnesium (from dolomitic lime) to the soil.

A soil test is a guide to what amount and kind of lime should be used. The desired pH levels may differ, depending on the soil properties and the crop to be grown.

Nitrogen fertilizer is required for most crops. It is generally not required, however, for peanuts and clover, in some rotations of soybeans, or for alfalfa that is established. A reliable soil test is not available for predicting nitrogen requirements. Appropriate rates of nitrogen application are described in the section "Yields per Acre."

Soil tests can indicate the need for phosphorus and potassium fertilizer. They are needed because phosphorus and potassium tend to build up in the soil.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper

planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

A high level of management includes maintaining proper soil reaction and fertility levels as indicated by standard soil tests. The application rate of nitrogen for corn on soils that have a yield potential of 125 to 150 bushels per acre should be 140 to 160 pounds per acre. If the yield potential for corn is 100 bushels per acre or less, a rate of about 100 to 120 pounds of nitrogen per acre should be used. The application of nitrogen in excess of that required for potential yields generally is not recommended. The excess nitrogen fertilizer that is not utilized by a crop is an unnecessary expense and causes a hazard of water pollution. If corn or cotton is grown after the harvest of soybeans or peanuts, nitrogen rates can be reduced by about 20 to 30 pounds per acre. Because nitrogen can be readily leached from sandy soils, applications may be needed on these soils more than once during the growing season.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the North Carolina Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for use as cropland *(13)*. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode, but they have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w,* or *s,* to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless a close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); and *s* shows that the soil is limited mainly because it is shallow or droughty.

There are no subclasses in class I because the soils of this class have few limitations. The soils in class V are subject to little or no erosion, but they have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation. Class V contains only the subclasses indicated by *w* or *s*.

The capability classification of each map unit component is given in the section "Detailed Soil Map Units" and in table 5.

Woodland Management and Productivity

Edwin J. Young, forester, Natural Resources Conservation Service, helped prepare this section.

Owners of woodland in Moore County have many objectives. These objectives include producing timber; conserving wildlife, soil, and water; esthetic values; and providing opportunities for recreational activities, such as commercial hunting. Public demand for clean water and recreation creates added pressures as well as opportunities for woodland owners.

The landowner interested in timber production is faced with the challenge of producing greater yields from smaller areas. Meeting this challenge requires intensive management and silvicultural practices. Many modern silvicultural techniques resemble those long practiced in agriculture. They include establishing, weeding, and thinning a desirable young stand; propagating the more productive species and genetic varieties; providing short rotations and complete fiber utilization; controlling insects, diseases, and weeds; and improving tree growth by applications of fertilizer and the installation of a drainage system. Even though timber crops require decades to grow, the goal of intensive management is similar to the goal of intensive agriculture. This goal is to produce the greatest yield of the most valuable crop as quickly as possible.

Commercial forests cover 334,158 acres, or about 74 percent of the land area of Moore County *(12)*. Commercial forest is land that is producing or is capable of producing crops of industrial wood and that has not been withdrawn from timber production. Loblolly pine is the most important timber species in the county because it grows fast, is adapted to the soil and climate, brings the highest average sale value per acre, and is easy to establish and manage.

Longleaf pine also is an important tree species. Pine straw production from this tree has become a multimillion dollar industry in the county. Longleaf pine is more common on soils that have a thick, sandy surface layer and subsurface layer or on soils that are sandy throughout, such as Candor, Kenansville, and Pactolus soils.

One of the first steps in planning intensive woodland management is to determine the potential productivity of the soil for several alternative tree species. The most productive and valued trees are then selected for each soil type. Site and yield information enables a forest manager to estimate future wood supplies. These estimates are the basis of realistic decisions concerning expenses and profits associated with intensive woodland management, land acquisition, or industrial investments.

The potential productivity of woodland depends on physiography, soil properties, climate, and the effects of past management. Specific soil properties and site characteristics, including soil depth, texture, structure, and depth to the water table, affect forest productivity primarily by influencing available water capacity, aeration, and root development. The net effects of the interaction of these soil properties and site characteristics determine the potential site productivity.

Other site factors are also important. The gradient and length of slopes affect water movement and availability. The amount of rainfall and length of growing season influence site productivity.

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to applications of fertilizer than others, and some are more susceptible to landslides and erosion after roads are built and timber is harvested. Some soils require special reforestation efforts. In the section "Detailed Soil Map Units," the description of each map unit in the survey area suitable for timber includes information about productivity, limitations in harvesting timber, and management concerns in producing timber. The common forest understory plants also are listed. Table 6 summarizes this forestry information and rates the soils for a number of factors to be considered in management. *Slight, moderate*, and *severe* are used to indicate the degree of the major soil limitations to be considered in forest management.

Table 6 lists the *ordination symbol* for each soil. The first part of the ordination symbol, a number, indicates the potential productivity of a soil for the indicator species in cubic meters per hectare per year. The larger the number, the greater the potential productivity. Potential productivity is based on the site index and the point where mean annual increment is the greatest.

The second part of the ordination symbol, a letter, indicates the major kind of soil limitation affecting use and management. The letter *R* indicates a soil that has a significant limitation because of the slope. The letter *W* indicates a soil in which excessive water, either seasonal or year-round, causes a significant limitation. The letter *D* indicates a soil that has a limitation because of a restricted rooting depth, such as a shallow soil that is underlain by hard bedrock, a hardpan, or other layers that restrict roots. The letter *C* indicates a soil that has a limitation because of the kind or amount of clay in the upper part of the profile. The letter *S* indicates a dry, sandy soil. The letter *A* indicates a soil having no significant limitations that affect forest use and management. If a soil has more than one limitation, the priority is as follows: R, W, D, C, and S.

Ratings of the *erosion hazard* indicate the probability that damage may occur if site preparation or harvesting

activities expose the soil. The risk is *slight* if no particular preventive measures are needed under ordinary conditions; *moderate* if erosion-control measures are needed for particular silvicultural activities; and *severe* if special precautions are needed to control erosion for most silvicultural activities. Ratings of moderate or severe indicate the need for construction of higher standard roads, additional maintenance of roads, additional care in planning harvesting and reforestation activities, or the use of special equipment.

Ratings of *equipment limitation* indicate limits on the use of forest management equipment, year-round or seasonal, because of such soil characteristics as slope, wetness, stoniness, and susceptibility of the surface layer to compaction. As slope gradient and length increase, the use of wheeled equipment becomes more difficult. On the steeper slopes, tracked equipment is needed. The rating is *slight* if equipment use is restricted by wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if slopes are so steep that wheeled equipment cannot be operated safely across the slope, if wetness restricts equipment use from 2 to 6 months per year, if stoniness restricts the use of ground-based equipment, or if special equipment is needed to prevent or minimize compaction. The rating is *severe* if slopes are so steep that tracked equipment cannot be operated safely across the slope, if wetness restricts equipment use for more than 6 months per year, if stoniness restricts the use of ground-based equipment, or if special equipment is needed to prevent or minimize compaction. Ratings of moderate or severe indicate a need to choose the best suited equipment and to carefully plan the timing of harvesting and other management activities.

Ratings of *seedling mortality* refer to the probability of the death of the naturally occurring or properly planted seedlings of good stock in periods of normal rainfall, as influenced by kinds of soil or topographic features. Seedling mortality is caused primarily by too much water or too little water. The factors used in rating a soil for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, rooting depth, and the aspect of the slope. The mortality rate generally is highest on soils that have a sandy or clayey surface layer. The risk is *slight* if, after site preparation, expected mortality is less than 25 percent; *moderate* if expected mortality is between 25 and 50 percent; and *severe* if expected mortality exceeds 50 percent. Ratings of moderate or severe indicate that it may be necessary to use containerized or larger than usual planting stock or to make special site preparations, such as bedding, furrowing, or installing a surface drainage system.

The *potential productivity* of *common trees* on a soil is expressed as a *site index* and a *volume* number. The predominant common trees are listed in table 6 in the order of their observed occurrence. Additional species that commonly occur on the soils may be listed in the detailed soil map unit descriptions. Generally, only two or three tree species dominate. The first tree listed for each soil is the indicator species for that soil. An indicator species is a tree that is common in the area and that is generally the most productive on a given soil.

For soils that are commonly used for timber production, the yield is predicted in cubic feet per acre per year. It is predicted at the point where mean annual increment culminates. The estimates of the productivity of the soils in this survey are based mainly on loblolly pine, longleaf pine, sweetgum, water oak, and yellow-poplar *(3, 4, 5, 7, 11)*.

The *site index* is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that the trees attain in a specified number of years (50 years in this survey). This index applies to fully stocked, even-aged, unmanaged stands. Productivity of a site can be improved through management practices, such as bedding, ditching, managing water, applying fertilizer, and planting genetically improved species.

The *volume* is the yield likely to be produced by the most important trees, expressed in cubic feet per acre per year.

Trees to plant are those that are used for reforestation or, under suitable conditions, natural regeneration. They are suited to the soils and can produce a commercial wood crop. The desired product, topographic position (such as a low, wet area), and personal preference are three factors among many that can influence the choice of trees for use in reforestation. If hardwoods are desired on a forest site, acceptable species should naturally reproduce from seeds and sprouts. Special site preparation techniques may be required.

Recreation

In table 7, the soils of the survey area are rated according to the limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water

impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 7, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 7 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 10 and interpretations for dwellings without basements and for local roads and streets in table 9.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have gentle slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes, stones, or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes. The suitability of the soil for tees or greens is not considered in rating the soils.

The soils primarily used for golf courses in Moore County are Ailey, Candor, Fuquay, and Vaucluse soils. Except for Vaucluse soils, these soils have a thick, sandy surface layer. Management concerns include droughtiness and the leaching of plant nutrients.

Wildlife Habitat

John P. Edwards, biologist, Natural Resources Conservation Service, helped prepare this section.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 8, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat. The ratings in table 8 are to be used as a guide and are not site specific. Onsite investigation is needed for individual management plans.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be

expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, and pokeberry.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwoods and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are autumn-olive and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, and slope. Examples of wetland plants are smartweed, wild millet, wildrice, cattail, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, cottontail rabbit, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and white-tailed deer.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey,

determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, the shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 9 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock or a very firm dense layer, stone content, soil texture, and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. The depth to a high water table, depth to bedrock, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. The depth to bedrock, depth to a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), the shrink-swell potential, frost-action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, depth to a high water table, depth to bedrock, and the available water capacity in the upper 40 inches affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established. Soil tests are essential to determine the liming and fertilizer needs. Help in making soil tests or in deciding what soil additive, if any, should be used can be obtained from the office of the Moore Soil and Water Conservation

District or the local office of the North Carolina Cooperative Extension Service.

Sanitary Facilities

Table 10 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 10 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and that good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, depth to a high water table, depth to bedrock, and flooding affect absorption of the effluent. Large stones and bedrock interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. The animal waste lagoons commonly used in farming operations are not considered in the ratings. They are generally deeper than the lagoons referred to in the table and rely on anaerobic bacteria to decompose waste materials.

Table 10 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, depth to a high water table, depth to bedrock, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope or bedrock can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in table 10 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock, depth to a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported

to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 11 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and the shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both (fig. 6). They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* have more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. These soils have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 11, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is as much as 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale, siltstone, and weathered granite saprolite, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, and depth to bedrock.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and

Figure 6.—An area of Candor sand, 0 to 4 percent slopes, used as a source of roadfill.

cobbles, have little or no gravel, and have slopes of less than 8 percent. They are naturally fertile or respond well to fertilizer and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and releases a variety of plant nutrients as it decomposes.

Water Management

Table 12 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required

This table also gives the restrictive features that affect each soil for drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or

embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability in the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area. Ponds that are less than about 2 acres in size are not shown on the soil maps because of the scale of mapping.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, mica, or salts or sodium. The depth to a high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock or to other layers that affect the rate of water movement, permeability, depth to a high water table or depth of standing water if the soil is subject to ponding, slope, susceptibility to flooding, subsidence of organic layers, and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock, large stones, slope, and the hazard of cutbanks caving. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock. The performance of a system is affected by the availability of suitable irrigation water, the depth of the root zone, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock affect the construction of terraces and diversions. Maintenance of terraces and diversions is adversely affected by a restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Wetness, slope, and depth to bedrock affect the construction of grassed waterways. A hazard of soil blowing, low available water capacity, restricted rooting depth, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed *(10)*. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 13 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages, by weight, of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, by volume, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20, or higher, for the poorest.

Rock fragments from 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3

inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

Physical and Chemical Properties

Table 14 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate, or component, consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated content of clay in each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence the shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at ⅓ bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of movement of water through the soil when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage in each major soil layer is stated in inches of water per inch of soil. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time. It is the difference between the amount of soil water at field moisture capacity and the amount at wilting point.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

The shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low,* a change of less than 3 percent; *moderate,* 3 to 6 percent; and *high,* more than 6 percent. *Very high,* more than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion. Losses are expressed in tons per acre per year. These estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values

of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 14, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 15 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep or very deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep to very deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil listed in table 15 is assigned to two hydrologic groups, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary covering of the surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 15 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency generally is expressed as *none, rare, occasional,* or *frequent. None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 to 5 percent in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year). *Frequent* means that flooding occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month). The time of year that floods are most likely to occur is expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered is local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 15 are the depth to the seasonal high water table; the kind of water table, that is, *perched* or *apparent* and the months of the year that the water table commonly is highest. A water table that is seasonally high for less than 1 month is not indicated in table 15.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A

perched water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and the amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(14)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or on laboratory measurements. Table 16 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Ultisol.

SUBORDER. Each order is divided into suborders, primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udult (*Ud*, meaning humid climate, plus *ult*, from Ultisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludults (*Hapl*, meaning minimal horizonation, plus *udult*, the suborder of the Ultisols that has an udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludults.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, siliceous, thermic Typic Hapludults.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. There can be some variation in the texture of the surface layer or of the substratum within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The location of the typical pedon is described, and coordinates generally are identified by the state plane grid system or by longitude and latitude. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" *(15)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(14)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Ailey Series

The Ailey series consists of well drained soils on Coastal Plain uplands. These soils have a thick, sandy surface layer and a dense, compact lower part of the B

horizon and C horizon formed in sandy and loamy marine sediments. Slopes range from 2 to 15 percent.

Ailey soils are commonly adjacent to Candor, Dothan, Fuquay, Gilead, and Vaucluse soils. Candor soils do not have a brittle Bt horizon. The combined thickness of the sandy A and E horizons in the Vaucluse and Dothan soils is less than 20 inches thick. Fuquay soils have more than 5 percent plinthite in the subsoil. Gilead soils are moderately well drained and have a clayey Bt horizon.

Typical pedon of Ailey loamy sand, 2 to 8 percent slopes; about 0.6 mile north of Foxfire Village on Secondary Road 1122, about 0.4 mile northwest of the intersection of Secondary Road 1122 and Secondary Road 1004, about 50 feet northeast of Secondary Road 1122, in a wooded area (State plane coordinates 1,828,000 feet E., 524,000 feet N.):

A—0 to 3 inches; dark gray (10YR 4/1) loamy sand; weak fine granular structure; very friable; common fine roots; less than 5 percent quartz gravel; strongly acid; clear smooth boundary.

E—3 to 30 inches; brownish yellow (10YR 6/6) sand; common medium faint light yellowish brown (10YR 6/4) mottles; loose; single grained; very friable; strongly acid; gradual wavy boundary.

Bt—30 to 42 inches; brownish yellow (10YR 6/8) sandy clay loam; common medium prominent reddish yellow (5YR 6/8) and few fine faint brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable; few distinct yellowish brown (10YR 5/6) clay films on faces of peds; less than 5 percent quartz gravel; very strongly acid; gradual wavy boundary.

Btx—42 to 50 inches; reddish yellow (7.5YR 6/8) sandy clay loam; common medium distinct reddish yellow (5YR 6/8) and brownish yellow (10YR 6/6) and common medium prominent red (2.5YR 5/8) mottles; coarse subangular blocky structure; firm, compact and brittle when dry; very strongly acid; gradual wavy boundary.

2C1—50 to 70 inches; yellowish red (5YR 5/8) sandy loam; common medium prominent brownish yellow (10YR 6/6) mottles; massive; hard, firm, compact in place; very strongly acid; gradual wavy boundary.

2C2—70 to 84 inches; reddish yellow (7.5YR 7/8) sandy loam; common medium distinct mottles in shades of red, brown, yellow, gray, and white; massive; hard, firm, compact in place; very strongly acid.

The sandy and loamy material is more than 60 inches thick. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. The Btx horizon is hard and compact when dry but is friable when moist.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 or 2.

The E horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 6. It is sand or loamy sand.

The Bt horizon has hue of 5YR to 10YR, value of 5 or 6, and chroma of 4 to 8. It has mottles in shades of brown, yellow, or red. It is sandy clay loam but ranges to sandy loam.

The Btx horizon has the same colors as the Bt horizon. It has mottles in shades of red, brown, or yellow. It has gray mottles in the lower part of some pedons. It is sandy clay loam or sandy loam.

The 2C horizon has hue of 2.5YR to 10YR, value of 4 to 7, and chroma of 4 to 8. It has mottles in shades of brown, red, yellow, white, or gray. It is sandy loam or sandy clay loam.

Bibb Series

The Bibb series consists of poorly drained soils on flood plains on the Coastal Plain. These soils are loamy throughout and formed in recent fluvial alluvium. Slopes range from 0 to 2 percent.

Bibb soils are commonly adjacent to Ailey, Candor, Dothan, Fuquay, Gilead, Johns, Kalmia, Kenansville, and Vaucluse soils. Ailey, Candor, Dothan, Fuquay, Gilead, and Vaucluse soils are on upland side slopes bordering the Bibb soils. Johns, Kalmia, and Kenansville soils are on low terraces along the Little River and James Creek. The adjacent soils are better drained than the Bibb soils.

Typical pedon of Bibb loam, 0 to 2 percent slopes, frequently flooded; about 7.5 miles south of Foxfire Village on Secondary Road 1004, about 200 yards north of the Moore-Richmond County line on Secondary Road 1004, about 100 feet east of Secondary Road 1004, on a flood plain (State plane coordinates 1,836,000 feet E., 479,000 feet N.):

A—0 to 12 inches; black (10YR 2/1) loam; weak fine granular structure; very friable; many fine, medium, and large roots; very strongly acid; clear smooth boundary.

Cg1—12 to 31 inches; dark grayish brown (10YR 4/2) fine sandy loam; massive; very friable; many fine and medium roots; very strongly acid; gradual wavy boundary.

Cg2—31 to 40 inches; light brownish gray (10YR 6/2) fine sandy loam; massive; very friable; few fine and medium roots; very strongly acid; gradual wavy boundary.

Cg3—40 to 70 inches; grayish brown (10YR 5/2) sandy loam; massive; friable; about 5 percent gravel; very strongly acid.

The loamy material is in the 10- to 40-inch control section. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed.

The A horizon has hue of 10YR or 7.5YR, value of 2 to 5, and chroma of 1 to 3.

The C horizon has hue of 10YR to 5Y, value of 3 to 6, and chroma of 2 or less. It is sandy loam, fine sandy loam, or loam. Thin strata of sand or loamy sand are in some pedons. In some pedons, the C horizon has thin strata that have a high content of gravel.

The Bibb soils in Moore County are taxadjuncts to the Bibb series because the surface layer has darker colors and is thicker than is typical for the Bibb series. These differences do not affect the behavior, use, and management of the soils.

Candor Series

The Candor series consists of somewhat excessively drained soils on Coastal Plain uplands. These soils formed in sandy and loamy sediments. Slopes range from 0 to 12 percent.

Candor soils are commonly adjacent to Ailey, Dothan, Fuquay, Gilead, and Vaucluse soils. Ailey and Fuquay soils have a loamy Bt horizon within 20 to 40 inches of the surface. The combined thickness of the sandy A and E horizons in the Dothan and Vaucluse soils is less than 20 inches. Gilead soils have a clayey Bt horizon.

Typical pedon of Candor sand, 0 to 4 percent slopes; about 0.9 mile northwest of Lakeview on Secondary Road 1843, about 100 feet south of Secondary Road 1843 and a farm path (State plane coordinates 1,902,000 feet E., 544,000 feet N.):

Ap—0 to 13 inches; grayish brown (10YR 5/2) sand; weak fine granular structure; very friable to loose; few fine and medium roots; strongly acid; abrupt smooth boundary.

E—13 to 26 inches; light yellowish brown (10YR 6/4) sand; loose; few fine and medium roots; strongly acid; gradual wavy boundary.

Bt—26 to 40 inches; yellowish brown (10YR 5/6) loamy sand; weak medium subangular blocky structure; very friable; very strongly acid; gradual wavy boundary.

E′—40 to 66 inches; light yellowish brown (10YR 6/4) sand; common medium distinct very pale brown (10YR 7/4) and yellowish brown (10YR 5/6) mottles; single grained; loose; very strongly acid; gradual wavy boundary.

B′t—66 to 80 inches; yellowish brown (10YR 5/8) sandy loam; common medium distinct light yellowish brown (10YR 6/4) and few fine distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; very strongly acid.

The thickness of the sandy horizons ranges from 40 to 80 inches. Reaction is extremely acid to strongly acid, except where the surface layer has been limed.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The E horizon has hue of 10YR, value of 6 or 7, and chroma of 3 to 6.

The B/E horizon, if it occurs, has hue of 7.5YR or 10YR, value of 6 to 8, and chroma of 3 to 8. It is loamy sand in the B part and sand in the E part.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 to 8.

The E′ horizon has hue of 7.5YR or 10YR, value of 5 to 8, and chroma of 3 to 8.

The B′t horizon has hue of 5YR to 10YR, value of 5 or 6, and chroma of 4 to 8, or it is mottled in shades of yellow or brown. It is sandy clay loam or sandy loam.

The BC horizon, if it occurs, has hue of 7.5YR, value of 6 to 8, and chroma of 4 to 8. In some pedons it also has yellowish red lamellae. It is sandy loam or sandy clay loam.

The C horizon, if it occurs, has hue of 5YR or 7.5YR, value of 6 or 7, and chroma of 3 to 8. It is sandy loam or sandy clay loam.

Chewacla Series

The Chewacla series consists of somewhat poorly drained soils on flood plains in the Piedmont and Coastal Plain. These soils formed in recent fluvial sediments. Slopes range from 0 to 2 percent.

Chewacla soils are commonly adjacent to Congaree and Wehadkee soils. Congaree soils are well drained and moderately well drained, and Wehadkee soils are poorly drained.

Typical pedon of Chewacla silt loam, 0 to 2 percent slopes, frequently flooded; 1.6 miles west of Glendon, about 1.9 miles north along Secondary Road 1006 from its intersection with Secondary Road 1621, about 500 feet west of Secondary Road 1006, in a mixed hardwood forest (State plane coordinates 1,879,700 feet E., 623,300 feet N.):

A—0 to 5 inches; dark brown (7.5YR 4/4) silt loam; few fine distinct yellowish brown (10YR 5/4) mottles; weak fine granular structure; very friable; few rounded concretions; common fine and medium roots; very strongly acid; clear smooth boundary.

Bw1—5 to 12 inches; yellowish brown (10YR 5/4) loam; few fine distinct yellowish red (5YR 4/6) mottles; weak fine subangular blocky structure; very friable;

few rounded concretions; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Bw2—12 to 20 inches; brown (7.5YR 5/4) loam; common fine distinct strong brown (7.5YR 5/8) and few fine distinct yellowish brown (10YR 5/4) and dark reddish brown (5YR 3/4) mottles; weak fine subangular blocky structure; very friable; few rounded concretions; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Bw3—20 to 31 inches; brown (7.5YR 5/4) fine sandy loam; few fine distinct strong brown (7.5YR 5/8) and dark reddish brown (5YR 3/4) and few fine prominent pinkish gray (7.5YR 7/2) mottles; weak fine subangular blocky structure; very friable; few rounded concretions; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Bw4—31 to 36 inches; brown (7.5YR 5/4) silt loam; common medium distinct brownish yellow (10YR 6/8) and light gray (10YR 7/2) mottles; weak fine subangular blocky structure; very friable; few rounded concretions; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Cg—36 to 70 inches; light gray (10YR 7/2) silt loam; common medium prominent brownish yellow (10YR 6/8) and red (2.5YR 5/8) mottles; massive; very friable; very strongly acid.

The combined thickness of the loamy horizons ranges from 36 to more than 60 inches. Reaction is very strongly acid to slightly acid, except where the surface layer has been limed. The number of dark concretions is common in some pedons. The number of mica flakes is few or common throughout some profiles.

The A horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 2 to 4 and is mottled in shades of brown.

The upper part of the Bw horizon has hue of 5YR to 2.5Y, value of 4 to 7, and chroma of 3 to 8. The lower part has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 1 to 8. Mottles that have chroma of 2 or less are within 24 inches of the surface. The Bw horizon has mottles in shades of red, brown, yellow, or gray. It is sandy clay loam, sandy loam, loam, silt loam, or clay loam. The content of clay by weighted average to a depth of 40 inches ranges from 18 to 34 percent.

The C horizon has hue of 10YR to 2.5YR, value of 4 to 7, and chroma of 1 to 8. It is silt loam, loam, sandy loam, loamy sand, or sand and gravel.

Congaree Series

The Congaree series consists of well drained and moderately well drained soils on flood plains along streams in the Piedmont. These soils formed in recent fluvial sediments. Slopes range from 0 to 2 percent.

Congaree soils are commonly adjacent to Chewacla and Wehadkee soils. Chewacla soils are somewhat poorly drained, and Wehadkee soils are poorly drained.

Typical pedon of Congaree loam, 0 to 2 percent slopes, frequently flooded; about 7 miles north of Robbins on Secondary Road 1456, about 4.2 miles northeast of the junction of North Carolina Highway 705 and Secondary Road 1456, about 0.45 mile north of Secondary Road 1456, along the flood plain of the Deep River (State plane coordinates 1,825,850 feet E., 639,300 feet N.):

Ap—0 to 10 inches; dark yellowish brown (10YR 4/6) loam; weak fine granular structure; very friable; common fine roots; moderately acid; clear smooth boundary.

C1—10 to 24 inches; yellowish brown (10YR 5/6) loam; few medium faint light yellowish brown (10YR 6/4) mottles; massive; friable; many small black concretions; moderately acid; gradual wavy boundary.

C2—24 to 32 inches; yellowish brown (10YR 5/6) loam; few fine distinct dark yellowish brown (10YR 4/6) and light yellowish brown (10YR 6/4) mottles; massive; friable; many small black concretions; neutral; gradual wavy boundary.

C3—32 to 42 inches; yellowish brown (10YR 5/6) loam; common medium distinct pale brown (10YR 6/3) and few fine distinct light yellowish brown (10YR 4/6) mottles; massive; friable; many small black concretions and charcoal fragments; neutral; gradual wavy boundary.

C4—42 to 70 inches; yellowish brown (10YR 5/6) silt loam; few fine distinct very pale brown (10YR 7/3) and common medium faint very pale brown (10YR 7/4) and dark yellowish brown (10YR 4/6) mottles; massive; friable; many small black concretions; neutral.

The loamy horizons range in thickness from 40 to more than 60 inches. Reaction is very strongly acid to neutral, except where the surface layer has been limed. Some part of the soil within a depth of 40 inches has a pH of 5.5 or more. Thin strata of contrasting textures are in the C horizon in some pedons. Most pedons have few flakes of mica.

The A or Ap horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 2 to 6.

The C horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 to 6. In some pedons, it has mottles in shades of red, brown, or yellow. In other pedons, it has mottles that have chroma of 2 or less below a depth of 20 inches. It is loam, silt loam, fine sandy loam, or silty clay loam to a depth of 60 inches or more.

Creedmoor Series

The Creedmoor series consists of moderately well drained and somewhat poorly drained soils on Piedmont uplands. These soils formed in material weathered from fine grained Triassic rocks. Slopes range from 2 to 10 percent.

Creedmoor soils are commonly adjacent to Mayodan, Mooshaunee, Hallison, and Pinkston soils. Mayodan soils are well drained. Mooshaunee soils have soft bedrock within a depth of 20 to 40 inches, and Hallison soils have soft bedrock within a depth of 40 to 60 inches. Pinkston soils have hard bedrock within a depth of 20 to 40 inches and less clay in the subsoil than the Creedmoor soils.

Typical pedon of Creedmoor fine sandy loam, 2 to 6 percent slopes; about 4.1 miles northwest of Carthage Courthouse, about 1.8 miles west of the intersection of Secondary Road 1644 and Secondary Road 1642, about 0.7 mile southwest on Secondary Road 1640 from its intersection with Secondary Road 1642, about 50 feet west of Secondary Road 1640, in a pine forest (State plane coordinates 1,865,125 feet E., 598,250 feet N.):

A—0 to 3 inches; pale brown (10YR 6/3) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; very strongly acid; clear smooth boundary.

E—3 to 8 inches; light yellowish brown (10YR 6/4) loam; few fine faint pale brown (10YR 6/3) and few fine distinct brownish yellow (10YR 6/6) mottles; weak medium granular structure; very friable; common fine and medium roots; very strongly acid; clear smooth boundary.

Bt1—8 to 14 inches; brownish yellow (10YR 6/6) silty clay loam; few prominent reddish yellow (5YR 6/8) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; very strongly acid; clear wavy boundary.

Bt2—14 to 24 inches; brownish yellow (10YR 6/6) clay; few fine distinct strong brown (7.5YR 5/8) and dark yellowish brown (10YR 4/6) and many fine prominent red (2.5YR 4/8) mottles; moderate coarse angular blocky structure; firm, sticky and plastic; common fine and medium roots; many distinct light yellowish brown (10YR 6/4) clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—24 to 35 inches; yellowish brown (10YR 5/6) clay; common fine distinct strong brown (7.5YR 5/8) and light gray (10YR 7/2) and common coarse prominent reddish brown (2.5YR 4/4 and 5/4) mottles; weak coarse angular blocky structure; very firm, sticky and plastic; few fine roots; many distinct light yellowish brown (10YR 6/4) and yellowish brown (10YR 5/6) clay films on faces of peds and in pores; very strongly acid; clear wavy boundary.

BC—35 to 59 inches; reddish brown (2.5YR 4/4) silty clay loam; common coarse prominent light greenish gray (5G 7/1) and few fine distinct strong brown (7.5YR 5/8) mottles; weak coarse angular blocky structure; very firm, slightly sticky and slightly plastic; few fine roots; common distinct reddish brown (5YR 5/4) clay films in pores; very strongly acid; gradual wavy boundary.

C—59 to 83 inches; reddish brown (2.5YR 4/4) silty clay loam that weathered from saprolite; few medium distinct yellowish red (5YR 5/6), common medium faint reddish brown (2.5YR 5/4), few fine distinct gray (5YR 5/1), and many coarse prominent light greenish gray (5G 7/1) mottles; massive; very firm, slightly sticky and slightly plastic; very strongly acid; abrupt wavy boundary.

Cr—83 to 99 inches; reddish brown (2.5YR 4/4) soft bedrock that crushes to silt loam; many coarse distinct gray (5YR 5/1) and light greenish gray (5G 7/1) and common coarse distinct pink (5YR 7/4) mottles; massive; very firm; very strongly acid.

The thickness of the clayey Bt horizon ranges from 15 to 50 inches. Reaction is extremely acid to strongly acid, except where the surface layer has been limed.

The A or Ap horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4.

The E horizon has hue of 7.5YR or 10YR, value of 6, and chroma of 3 to 6. It is fine sandy loam, loam, or silt loam.

The upper part of the Bt horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 3 to 8. The lower part has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2 to 8. The Bt horizon has mottles in shades of red, yellow, brown, or gray. It is clay, silty clay, silty clay loam, sandy clay loam, or clay loam. The content of clay by weighted average in the particle-size control section is more than 35 percent.

The BC horizon has hue of 2.5YR to 10YR, value of 4 to 7, and chroma of 1 to 8. It has gray streaks and mottles. It is silty clay loam or clay loam. The BC horizon generally has a few fragments similar to those in the C horizon. The number of mica flakes is few or common.

The C horizon has hue of 2.5YR to 2.5Y, value of 3 to 8, and chroma of 1 to 8 or is mottled in shades of red, white, gray, or brown. It is saprolite that crushes to silt loam, loam, clay loam, sandy loam, or silty clay loam.

The Cr horizon is reddish brown and mottled with

gray, greenish gray, or pink. It is partly decomposed soft bedrock.

Dothan Series

The Dothan series consists of well drained soils on Coastal Plain uplands. These soils formed in moderately fine textured Coastal Plain sediments. Slopes range from 0 to 6 percent.

Dothan soils are commonly adjacent to Ailey, Candor, Fuquay, Gilead, and Vaucluse soils. The combined thickness of the sandy A and E horizons in the Ailey and Fuquay soils is more than 20 inches. Candor soils have a sandy particle-size control section. Gilead soils have a clayey subsoil. Vaucluse soils have a solum that is 40 to more than 60 inches thick.

Typical pedon of Dothan loamy sand, 0 to 2 percent slopes; about 0.5 mile north of Mt. Pleasant on Secondary Road 2018 and 140 feet north of Secondary Road 2018 and a farm path, in a field (State plane coordinates 1,961,850 feet E., 530,750 feet N.):

Ap—0 to 11 inches; yellowish brown (10YR 5/4) loamy sand; weak medium granular structure; very friable; few fine roots; slightly acid; clear smooth boundary.

Bt1—11 to 34 inches; brownish yellow (10YR 6/8) sandy clay loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; thin patchy clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—34 to 42 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; thin patchy clay films on faces of peds; strongly acid; gradual wavy boundary.

Btv1—42 to 60 inches; mottled strong brown (7.5YR 5/8), brownish yellow (10YR 6/8), light gray (10YR 7/2), and red (2.5YR 4/8) sandy clay loam; moderate coarse subangular blocky structure; firm, slightly hard, compact in place; slightly sticky and slightly plastic; thin patchy clay films on faces of peds; about 20 percent nodules of plinthite; very strongly acid; gradual wavy boundary.

Btv2—60 to 68 inches; mottled strong brown (7.5YR 5/8), brownish yellow (10YR 6/8), light gray (10YR 7/2), and red (2.5YR 4/8) sandy clay loam that has strata of sandy loam; weak coarse subangular blocky structure; firm and compact in place; slightly sticky and slightly plastic; about 10 percent nodules of plinthite; very strongly acid; gradual wavy boundary.

Btv3—68 to 72 inches; mottled strong brown (7.5YR 5/8), brownish yellow (10YR 6/8), light gray (10YR 7/2), and red (2.5YR 5/8) sandy clay loam; very thick platy structure; firm, slightly sticky and slightly plastic; about 10 percent plinthite; very strongly acid; gradual wavy boundary.

Btv4—72 to 84 inches; mottled strong brown (7.5YR 5/8), brownish yellow (10YR 6/8), light gray (10YR 7/2), and red (2.5YR 4/8) sandy clay loam; very thick platy structure; firm, slightly hard, compact in place; slightly sticky and slightly plastic; about 25 percent nodules of plinthite; very strongly acid.

The combined thickness of the A and B horizons ranges from 60 to more than 80 inches. The depth to horizons that contain 5 percent or more plinthite ranges from 30 to 60 inches. Reaction is very strongly acid to moderately acid, except where the surface layer has been limed.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4.

The E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 or 4. It is loamy sand.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 to 8, and chroma of 4 to 8. It has mottles in shades of brown or red. It is sandy loam, sandy clay loam, or clay loam. The particle-size control section has 18 to 34 percent clay.

The Btv horizon has hue of 2.5YR to 10YR, value of 4 to 7, and chroma of 2 to 8, or it is mottled in shades of yellow, gray, red, or brown. It is sandy loam, sandy clay loam, or sandy clay. It has 5 to 35 percent, by volume, nonindurated plinthite.

Fuquay Series

The Fuquay series consists of well drained soils on Coastal Plain uplands. These soils formed in loamy Coastal Plain sediments. Slopes range from 0 to 6 percent.

Fuquay soils are commonly adjacent to Ailey, Candor, Dothan, Gilead, and Vaucluse soils. Ailey soils do not have plinthite. Candor soils have a sandy particle-size control section. Dothan and Vaucluse soils have a sandy surface layer that is less than 20 inches thick. Gilead soils have a clayey particle-size control section.

Typical pedon of Fuquay loamy sand, 0 to 6 percent slopes; about 4.2 miles west of Cameron on North Carolina Highways 24 and 27, about 100 feet south of North Carolina Highways 24 and 27, in a cultivated field (State plane coordinates 1,904,750 feet E., 573,500 feet N.):

Ap—0 to 11 inches; brown (10YR 5/3) loamy sand; weak medium granular structure; very friable; strongly acid; clear smooth boundary.

E—11 to 28 inches; very pale brown (10YR 7/4) loamy

sand; common fine distinct brownish yellow (10YR 6/6) mottles; weak medium granular structure; very friable; strongly acid; clear smooth boundary.

Bt1—28 to 35 inches; brownish yellow (10YR 6/6) sandy loam; few fine distinct yellowish brown (10YR 5/8) mottles; weak fine subangular blocky structure; very friable; strongly acid; gradual wavy boundary.

Bt2—35 to 40 inches; brownish yellow (10YR 6/6) sandy clay loam; few fine distinct yellowish brown (10YR 5/8) and light gray (10YR 7/2) and few fine prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; about 2 percent plinthite; very strongly acid; gradual wavy boundary.

Btv1—40 to 44 inches; brownish yellow (10YR 6/6) and light gray (10YR 7/2) sandy clay loam; common fine distinct strong brown (7.5YR 5/8) and common fine prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; compact in place; about 25 percent plinthite; very strongly acid; gradual wavy boundary.

Btv2—44 to 48 inches; mottled strong brown (7.5YR 5/8), red (2.5YR 4/6), and brownish yellow (10YR 6/6) sandy clay loam that has strata of light gray (10YR 7/2) sandy clay; moderate coarse subangular blocky structure; firm, slightly sticky and slightly plastic; compact in place; about 25 percent plinthite; very strongly acid; gradual wavy boundary.

Btv3—48 to 80 inches; mottled strong brown (7.5YR 5/8), light gray (10YR 7/2), brownish yellow (10YR 6/8), and red (2.5YR 4/6) sandy clay loam that has strata of sandy clay; very coarse platy structure parting to coarse platy; firm and compact in place; about 10 percent plinthite; very strongly acid.

The combined thickness of the sandy and loamy horizons is commonly more than 60 inches. The depth to a horizon containing more than 5 percent plinthite ranges from 35 to 60 inches. Reaction is very strongly acid to moderately acid, except where the surface layer has been limed. In some pedons, a few rounded, rough surfaced or smooth nodules of iron are on the surface and throughout the A horizon.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 3.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. It is loamy sand or sand.

The BE horizon, if it occurs, has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 3 to 8. It is loamy sand or sandy loam.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 8. It is mottled in shades of brown, gray, yellow, or red. It is sandy loam or sandy clay loam.

The Btv horizon has hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 2 to 8, or it is mottled in shades of brown, yellow, red, or gray. It is sandy clay loam that has strata of sandy clay in the lower part. The bodies of reddish plinthite are hard and are surrounded by strong brown and yellowish brown soft soil material. The reddish and brownish parts are sandy clay loam or sandy loam. The grayish parts are sandy clay loam or sandy clay. In most pedons, the redder parts of the plinthite are horizontally oriented.

The C horizon, if it occurs, is mottled with hue of 2.5YR to 2.5Y, value of 4 to 8, and chroma of 1 to 8. Texture is sandy loam or loamy sand.

Georgeville Series

The Georgeville series consists of well drained soils on Piedmont uplands. These soils formed in material weathered from metamorphic rocks. Slopes range from 2 to 15 percent.

Georgeville soils are commonly adjacent to Goldston, Iredell, Lignum, Nason, and Tatum soils. Goldston soils are loamy-skeletal and have hard bedrock within 20 to 40 inches of the surface. Iredell soils are moderately well drained, and Lignum soils are somewhat poorly drained. Nason and Tatum soils have soft bedrock within a depth of 40 to 60 inches. Tatum and Iredell soils have mixed mineralogy.

Typical pedon of Georgeville gravelly silt loam, 2 to 8 percent slopes; about 1.5 miles east of Robbins on Secondary Road 1477, about 1.7 miles north of the intersection of Secondary Road 1479 and Secondary Road 1477 to Secondary Road 1483, about 0.2 mile east on Secondary Road 1483, about 50 feet north of Secondary Road 1483, in a cultivated field (State plane coordinates 1,836,000 feet E., 619,250 feet N.):

Ap—0 to 8 inches; yellowish red (5YR 4/6) gravelly silt loam; weak medium granular structure; very friable; common fine roots; about 18 percent quartz gravel; very strongly acid; clear smooth boundary.

Bt1—8 to 27 inches; red (2.5YR 4/8) clay; few fine distinct yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—27 to 43 inches; red (2.5YR 4/8) clay; few fine prominent brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—43 to 59 inches; red (2.5YR 4/8) silty clay loam; common fine prominent brownish yellow (10YR 6/8)

and common medium prominent yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

C—59 to 78 inches; red (2.5YR 5/8) silt loam; common medium prominent brownish yellow (10YR 6/6) and common medium distinct weak red (10R 5/4) mottles; massive; very friable; very strongly acid.

The thickness of the solum ranges from 40 to 60 inches. The depth to bedrock is more than 60 inches. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. Some pedons have few flakes of mica.

The A or Ap horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 4 to 8.

The E horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6. It is silt loam, loam, or the gravelly analogs of those textures.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 to 8 and is mottled in shades of yellow, brown, or red. It is silty clay loam, silty clay, or clay.

The C horizon has hue of 10R to 10YR, value of 4 to 6, and chroma of 6 to 8 and is mottled in shades of yellow or red. It is silt loam, loam, or very fine sandy loam.

Gilead Series

The Gilead series consists of moderately well drained soils on Coastal Plain uplands. These soils formed in fine textured Coastal Plain sediments. Slopes range from 2 to 15 percent.

Gilead soils are commonly adjacent to Ailey, Candor, Dothan, Fuquay, and Vaucluse soils. Ailey and Fuquay soils have sandy surface and subsurface horizons that are more than 20 inches thick. Candor soils have a sandy particle-size control section. Dothan soils have plinthite within 24 to 60 inches of the surface. Vaucluse soils have a dense, brittle Btx horizon.

Typical pedon of Gilead loamy sand, 2 to 8 percent slopes; about 6.6 miles southwest of Carthage on Secondary Road 1229, about 0.7 mile west on Secondary Road 1229 from its intersection with Secondary Road 1210, about 50 feet south of Secondary Road 1229, in a cultivated field (State plane coordinates 1,843,550 feet E., 558,350 feet N.):

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) loamy sand; few fine distinct brownish yellow (10YR 6/6) mottles; weak fine granular structure; very friable; few fine roots; strongly acid; clear smooth boundary.

Bt1—8 to 17 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium distinct reddish yellow (7.5YR 6/8) mottles; weak medium subangular blocky structure; friable; few fine flakes of mica; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—17 to 26 inches; brownish yellow (10YR 6/6) sandy clay; common medium prominent yellowish red (5YR 5/8), reddish yellow (7.5YR 6/8), and light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine flakes of mica; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—26 to 40 inches; mottled brownish yellow (10YR 6/6), red (2.5YR 5/8), light gray (10YR 7/2), and reddish yellow (7.5YR 6/8) sandy clay; moderate medium subangular blocky structure; very firm, sticky and plastic; few fine flakes of mica; few distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt4—40 to 50 inches; mottled light gray (10YR 7/2), red (2.5YR 5/8), light reddish brown (5YR 6/4), reddish yellow (7.5YR 6/8), and brownish yellow (10YR 6/8) sandy clay loam that has pockets of sandy clay; weak coarse subangular blocky structure; firm; few fine pebbles; few fragments of ironstone; very strongly acid; gradual wavy boundary.

C—50 to 80 inches; light brown (7.5YR 6/4) sandy loam; common medium prominent light gray (10YR 7/2), very pale brown (10YR 7/4), and brownish yellow (10YR 6/6) mottles; massive; very friable; few fine pebbles; very strongly acid.

The thickness of the solum ranges from 30 to 60 inches over marine sediments. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 or 3 and is mottled in shades of yellow or brown.

The E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 4. It is loamy sand, sandy loam, or the gravelly analogs of those textures.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 3 to 8. The upper part is mottled in shades of brown, yellow, or red. The lower part is mottled in shades of gray, red, brown, yellow, or white. The texture is sandy clay, clay, clay loam, or sandy clay loam. The particle-size control section has 35 to 60 percent clay.

The Btg horizon, if it occurs, has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 1 or 2. It is sandy clay loam, clay loam, or sandy loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 4

to 8, and chroma of 1 to 4, or it is mottled in shades of gray, brown, or yellow. It is sandy loam or sandy clay loam.

Goldston Series

The Goldston series consists of shallow, well drained to excessively drained soils on Piedmont uplands. These soils formed in material weathered from metamorphic rocks. Slopes range from 2 to 45 percent.

Goldston soils are commonly adjacent to Georgeville, Lignum, Nason, and Tatum soils. The adjacent soils have a clayey subsoil. Georgeville soils have bedrock at a depth of more than 60 inches. Lignum soils have hard bedrock at a depth of more than 40 inches. Nason and Tatum soils have soft bedrock at a depth of 40 to 60 inches.

Typical pedon of Goldston very channery silt loam, 15 to 45 percent slopes; 1 mile southeast of High Falls along North Carolina Highway 22, about 500 feet southeast of Buffalo Creek bridge on North Carolina Highway 22, about 75 feet northeast of North Carolina Highway 22 (State plane coordinates 1,846,800 feet E., 626,400 feet N.):

A—0 to 5 inches; brown (10YR 4/3) very channery silt loam; weak medium granular structure; very friable; few fine roots; 42 percent, by volume, slate and gravel fragments ⅛ inch to 3 inches in size; very strongly acid; clear wavy boundary.

Bw—5 to 12 inches; light yellowish brown (10YR 6/4) very channery silt loam; weak fine subangular blocky structure; very friable; few fine roots; 47 percent, by volume, slate and gravel fragments ⅛ inch to 3 inches in size; very strongly acid; clear wavy boundary.

Cr—12 to 24 inches; fractured, sericitic schist and slate rock; moderately hard; seams of very pale brown (10YR 7/3) silt loam in cracks; very strongly acid; gradual irregular boundary.

R—24 inches; hard, sericitic schist rock.

The thickness of the loamy horizons and the depth to weathered, fractured bedrock range from 10 to 20 inches. The depth to hard bedrock ranges from 20 to 40 inches. The content of slate fragments ranges from 35 to 50 percent in the A and B horizons. Reaction is extremely acid to strongly acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR, value of 4 to 6, and chroma of 1 to 4.

The Bw horizon and the AC horizon, if it occurs, have hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 3 to 6. They have mottles in shades of brown, yellow, or red in some pedons. They are very channery silt loam.

The Cr horizon is dominated by multicolored, partly weathered, fractured, sericitic schist and slate rock. The R horizon is slate or sericitic schist rock.

Hallison Series

The Hallison series consists of well drained and moderately well drained, moderately slowly permeable soils that formed in material weathered from fine grained Triassic rocks. Slopes are commonly 2 to 15 percent but range to 25 percent.

Hallison soils are commonly adjacent to Creedmoor, Iredell, Mayodan, Mooshaunee, and Pinkston soils. Creedmoor and Mayodan soils are clayey. Creedmoor soils do not have a Cr horizon within a depth of 60 inches. Iredell soils are clayey and are more than 60 inches deep over bedrock. Mooshaunee soils have soft bedrock at a depth of 20 to 40 inches. Pinkston soils are coarse-loamy and have hard bedrock at a depth of 20 to 40 inches.

Typical pedon of Hallison silt loam, in an area of Mooshaunee-Hallison complex, 2 to 8 percent slopes; about 2.4 miles northwest of Carthage on North Carolina Highways 24 and 27, about 0.5 mile north on North Carolina Highway 22 from its intersection with North Carolina Highways 24 and 27, about 0.2 mile east of North Carolina Highway 22 on a logging road, about 10 feet north of the logging road, in a stand of loblolly pine (State plane coordinates 1,856,000 feet E., 599,400 feet N.):

Ap—0 to 7 inches; brown (10YR 5/3) silt loam; weak medium granular structure; friable; common medium and fine roots; few fine iron and manganese concretions; strongly acid; clear smooth boundary.

E—7 to 11 inches; pale brown (10YR 6/3) loam; weak fine granular structure; friable; common fine roots; few fine iron and manganese concretions; very strongly acid; gradual wavy boundary.

Bt1—11 to 16 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium and fine subangular blocky structure; firm; few fine roots; few iron and manganese concretions; few faint clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—16 to 23 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots; few iron and manganese concretions; few faint brown (7.5YR 5/4) clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—23 to 36 inches; strong brown (7.5YR 5/8) silty clay loam; few fine prominent reddish brown (5YR 4/4) mottles; moderate medium subangular blocky

structure; firm; few fine roots; few fine iron and manganese concretions; few distinct reddish brown (5YR 5/4) clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt4—36 to 41 inches; strong brown (7.5YR 5/6) silty clay loam; few medium prominent very pale brown (10YR 7/4) mottles; weak coarse subangular blocky structure; firm; few fine roots; few fine iron and manganese concretions; few distinct yellowish red (5YR 5/6) clay films on faces of peds; very strongly acid; gradual wavy boundary.

BC—41 to 48 inches; dark reddish brown (2.5YR 3/4) silty clay loam; few fine prominent light gray (10YR 7/2), common fine prominent brown (7.5YR 5/2), and few medium prominent yellow (10YR 7/6) mottles; weak coarse subangular blocky structure; firm; few iron and manganese concretions; very strongly acid; gradual wavy boundary.

Cr—48 to 60 inches; dark reddish brown (2.5YR 3/4) siltstone that crushes with moderate pressure to silt loam.

The thickness of the solum and the depth to soft bedrock range from 40 to 60 inches. Reaction is extremely acid to strongly acid, except where the surface layer has been limed. The content of coarse fragments ¼ inch to 10 inches in size ranges from 0 to 5 percent in the Ap and Bt horizons. Some pedons have as much as 5 percent iron and manganese concretions in the A and Bt horizons.

The Ap or A horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 6.

The E horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 3 to 6. It is silt loam, fine sandy loam, very fine sandy loam, or loam.

The Bt horizon has hue of 5YR to 10YR, value of 4 to 7, and chroma of 4 to 8. It has mottles in shades of brown, yellow, or red in most pedons. It is silty clay loam or clay loam. In some pedons, a thin Bt horizon of silty clay is just above the Cr horizon.

The BC or CB horizon has hue of 2.5YR to 7.5YR, value of 3 to 7, and chroma of 2 to 8 and is mottled in shades of gray, yellow, or brown. It is silty clay loam, clay loam, or silt loam.

The C horizon, if it occurs, generally has hue of 2.5YR to 7.5YR, value of 3 to 6, and chroma of 4 to 8 and has mottles in shades of red, brown, yellow, or gray. In some pedons it has no dominant matrix color and is mottled with these colors. It is silt loam, loam, very fine sandy loam, fine sandy loam, or loam.

The Cr horizon has hue of 10R to 7.5YR, value of 3 to 6, and chroma of 2 to 8. It is soft bedrock that crushes to loam, silt loam, or fine sandy loam. The R horizon, if it occurs, is Triassic sedimentary rock.

Iredell Series

The Iredell series consists of moderately well drained soils on Piedmont uplands. These soils formed in material weathered from dark, basic rocks that have a high content of ferromagnesian minerals. Slopes range from 2 to 6 percent.

Iredell soils are commonly adjacent to Georgeville, Mayodan, Mooshaunee, Hallison, Nason, and Pinkston soils. Georgeville, Mayodan, and Nason soils are well drained. Pinkston soils are well drained to excessively drained. Hallison soils are well drained and moderately well drained. Georgeville and Mayodan soils have a redder subsoil than the Iredell soils. Pinkston soils have hard bedrock at a depth of 20 to 40 inches. Mooshaunee soils have soft bedrock at a depth of 20 to 40 inches. Hallison and Nason soils have soft bedrock at a depth of 40 to 60 inches.

Typical pedon of Iredell clay loam, 2 to 6 percent slopes; about 0.4 mile south of the Moore-Chatham County line on Secondary Road 1621, about 75 feet northwest of the intersection of Secondary Road 1621 and a railroad crossing, in a pasture (State plane coordinates 1,893,700 feet E., 641,850 feet N.):

Ap—0 to 7 inches; dark grayish brown (2.5Y 4/2) clay loam; moderate coarse granular structure; firm, sticky and plastic; many fine roots; many black concretions; slightly acid; clear smooth boundary.

Bt1—7 to 18 inches; light olive brown (2.5Y 5/4) clay; common medium prominent strong brown (7.5YR 5/8) mottles; weak coarse angular blocky structure; very firm, very sticky and very plastic; common fine roots; common black concretions; continuous clay films on faces of peds; slightly acid; gradual wavy boundary.

Bt2—18 to 25 inches; yellowish brown (10YR 5/6) clay; common medium distinct strong brown (7.5YR 5/8) and common fine distinct dark brown (10YR 3/3) mottles; weak coarse subangular blocky structure; very firm, very sticky and very plastic; common black concretions; continuous clay films on faces of peds; neutral; gradual wavy boundary.

C1—25 to 38 inches; yellowish brown (10YR 5/8) sandy clay loam; few fine prominent yellowish red (5YR 5/8) and few fine distinct strong brown (7.5YR 5/8) and dark yellowish brown (10YR 3/6) mottles; massive; friable; few black concretions; neutral; gradual wavy boundary.

C2—38 to 62 inches; yellowish brown (10YR 5/8) sandy loam; few fine prominent yellowish red (5YR 5/8) and few fine distinct dark yellowish brown (10YR 3/6) and strong brown (7.5YR 5/8) mottles; massive; friable; mildly alkaline.

The thickness of the solum ranges from 20 to 40 inches. The depth to bedrock is more than 60 inches. Reaction is strongly acid to neutral in the A horizon, except where the surface layer has been limed, moderately acid to neutral in the B horizon, and slightly acid to slightly alkaline in the C horizon. Horizons that have more than 35 percent clay and a COLE of more than .09 are less than 20 inches thick. Dark iron and manganese concretions range from few to many throughout the profile.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4.

The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 to 6 and typically is mottled in shades of brown or yellow.

The CB horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5, and chroma of 4 to 8. It is sandy clay loam, clay loam, or loam.

The C horizon has hue of 10YR to 5Y, value of 4 to 8, and chroma of 1 to 8, or it is neutral and has value of 4 to 8, or it is mottled in shades of brown, yellow, or gray. It is sandy clay loam or sandy loam.

Johns Series

The Johns series consists of somewhat poorly drained and moderately well drained soils on terraces along the Little River. These soils formed in stratified fluvial sediments of coarse or medium textures. Slopes range from 0 to 2 percent.

Johns soils are commonly adjacent to Bibb, Kalmia, Kenansville, and Pactolus soils. Bibb soils are poorly drained. Kalmia soils are well drained. Kenansville soils have less clay than the Johns soils and thicker surface and subsurface layers. Pactolus soils do not have a Bt horizon.

Typical pedon of Johns fine sandy loam, 0 to 2 percent slopes; about 2.9 miles east of Mt. Pleasant on Secondary Road 1001, about 1.2 miles south of Secondary Road 1001 (State plane coordinates 1,962,000 feet E., 570,375 feet N.):

A—0 to 7 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; gradual wavy boundary.

BE—7 to 11 inches; yellowish brown (10YR 5/4) sandy loam; weak fine subangular blocky structure; very friable; many fine roots; strongly acid; gradual wavy boundary.

Bt1—11 to 23 inches; yellowish brown (10YR 5/4) sandy clay loam; common medium prominent red (2.5YR 4/8) mottles; weak medium subangular blocky structure; friable; many fine and medium roots; common flakes of mica; very strongly acid; gradual wavy boundary.

Bt2—23 to 26 inches; yellowish brown (10YR 5/4) sandy loam; common medium prominent red (2.5YR 4/8) and common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; common flakes of mica; very strongly acid; gradual wavy boundary.

2Cg—26 to 60 inches; light gray (10YR 7/1) sand; common medium prominent brownish yellow (10YR 6/8) and few fine prominent red (2.5YR 4/8) mottles; single grained; loose; very strongly acid.

The thickness of the solum ranges from 20 to 40 inches. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2.

The E horizon, if it occurs, has hue of 10YR, value of 5 to 7, and chroma of 3 or 4. It is sandy loam or loamy sand.

The BE horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. It is sandy loam or fine sandy loam.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 4 to 8. It has mottles in shades of red, brown, gray, or yellow. In some pedons, the lower part has a gray matrix with chroma of 1 or 2 or is mottled in shades of gray or brown. The texture is sandy clay loam or sandy loam. The content of clay by weighted average in the particle-size control section ranges from 18 to 34 percent.

The BC or CB horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It is sandy loam.

The 2Cg horizon has hue of 10YR or 5Y, value of 5 to 7, and chroma of 1. It is sand or loamy sand. In some pedons it has thin lenses of loam or sandy loam.

Kalmia Series

The Kalmia series consists of well drained soils on stream terraces along James Creek and the Little River. These soils formed in loamy fluvial sediments. Slopes range from 0 to 2 percent.

Kalmia soils are commonly adjacent to Bibb, Johns, Kenansville, and Pactolus soils. Bibb soils are poorly drained. Johns and Pactolus soils are moderately well drained and somewhat poorly drained. Kenansville soils have sandy surface and subsurface layers that are 20 to 40 inches thick.

Typical pedon of Kalmia sandy loam, wet substratum, 0 to 2 percent slopes; about 4.4 miles east of Mt. Pleasant on Secondary Road 1001, about 250 feet south of Secondary Road 1001 (State plane coordinates 1,971,100 feet E., 521,200 feet N.):

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) sandy loam; weak medium granular structure; very friable; common fine roots; moderately acid; clear smooth boundary.
E—5 to 12 inches; grayish brown (2.5Y 5/2) sandy loam; weak medium granular structure; very friable; common fine roots; strongly acid; clear smooth boundary.
Bt1—12 to 17 inches; light yellowish brown (10YR 6/4) sandy clay loam; few fine prominent reddish yellow (5YR 6/8) mottles; weak medium subangular blocky structure; friable; slightly sticky and slightly plastic; few fine roots; thin patchy clay films on faces of peds; strongly acid; gradual wavy boundary.
Bt2—17 to 37 inches; light yellowish brown (10YR 6/4) sandy clay loam; common fine prominent reddish yellow (5YR 6/8) and few fine prominent strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; thin patchy clay films on faces of peds; strongly acid; gradual wavy boundary.
2C—37 to 60 inches; pale yellow (2.5Y 7/4) sand; common fine prominent reddish yellow (5YR 6/8), few fine prominent strong brown (7.5YR 5/8), and common fine distinct light gray (10YR 7/2) mottles; single grained; very strongly acid.

The combined thickness of the loamy A and B horizons ranges from 20 to 39 inches over sandy sediments. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. The seasonal high water table is at a depth of 3 to 5 feet.

The Ap or A horizon has hue of 10YR, value of 4 or 5, and chroma of 1 to 3.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 2 to 6.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. Mottles that have low chroma are in some pedons. It is sandy clay loam and sandy loam. The particle-size control section has 18 to 34 percent clay.

The BC horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. It is sandy loam or sandy clay loam.

The 2C horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 1 to 8, or it is mottled in shades of yellow, brown, gray, or red. It is sand or loamy sand.

Kenansville Series

The Kenansville series consists of well drained soils on stream terraces along James Creek and the Little River. These soils formed in loamy fluvial sediments. Slopes range from 0 to 4 percent.

Kenansville soils are commonly adjacent to Bibb, Johns, Kalmia, and Pactolus soils. Bibb soils are poorly drained. Johns soils are somewhat poorly drained and moderately well drained. Kalmia soils have a sandy surface layer that is less than 20 inches thick. Pactolus soils do not have a Bt horizon.

Typical pedon of Kenansville loamy sand, 0 to 4 percent slopes; 4 miles east of Mt. Pleasant on Secondary Road 1001, about 0.5 mile south of the intersection of Secondary Road 1001 and Becker sand pit road, in an area of wildlife habitat (State plane coordinates 1,969,000 feet E., 519,350 feet N.):

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) loamy sand; weak medium granular structure; very friable; few fine roots; about 5 percent gravel; strongly acid; clear smooth boundary.
E—6 to 22 inches; yellowish brown (10YR 5/4) loamy sand; few fine distinct brownish yellow (10YR 6/6) mottles; very friable; few fine roots; very strongly acid; clear smooth boundary.
Bt—22 to 36 inches; yellowish brown (10YR 5/6) sandy loam; weak fine subangular blocky structure; friable; few fine roots; common distinct clay coating and bridging sand grains; very strongly acid; clear wavy boundary.
BC—36 to 48 inches; brownish yellow (10YR 6/6) loamy sand; weak medium granular structure; very friable; few fine roots and pores; few clay bridges between sand grains; very strongly acid; gradual wavy boundary.
C1—48 to 60 inches; very pale brown (10YR 8/4) sand; common fine faint very pale brown (10YR 7/3) mottles; single grained; loose; 5 to 8 percent gravel; very strongly acid; gradual wavy boundary.
C2—60 to 80 inches; light gray (10YR 7/2) sand; few fine distinct brownish yellow (10YR 6/6) mottles; single grained; loose; very strongly acid.

The combined thickness of the sandy A and E horizons and the loamy Bt horizon ranges from 30 to 50 inches. Reaction is very strongly acid to moderately acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 6. It is loamy sand or sand.

The Bt horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. It is sandy loam. Thin layers of sandy clay loam are present in some pedons.

The BC horizon has matrix colors similar to those of the Bt horizon. Mottles that have low chroma are

present in some pedons. It is sandy loam or loamy sand.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 8, and chroma of 1 to 6 or is mottled in shades of brown, yellow, or gray. It is loamy sand or sand.

Lignum Series

The Lignum series consists of deep, somewhat poorly drained soils on Piedmont uplands. These soils formed in material weathered from metamorphic rocks. Slopes range from 2 to 12 percent.

Lignum soils are commonly adjacent to Georgeville, Goldston, Nason, and Tatum soils. Georgeville, Nason, and Tatum soils are well drained. Georgeville and Tatum soils have hue of 5YR or redder in the Bt horizon. Goldston soils are shallower than the Lignum soils and are well drained to excessively drained.

Typical pedon of Lignum silt loam, 2 to 7 percent slopes; 10.1 miles southwest of Robbins on North Carolina Highways 24 and 27, about 1.4 miles north on Secondary Road 1281 from its intersection with North Carolina Highways 24 and 27, about 30 feet west of Secondary Road 1281, in a pine forest (State plane coordinates 1,789,000 feet E., 592,400 feet N.):

A—0 to 2 inches; grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable; common fine and medium roots; very strongly acid; clear smooth boundary.

E—2 to 12 inches; very pale brown (10YR 7/3) silt loam; few fine distinct reddish yellow (7.5YR 6/8) mottles; weak fine granular structure; friable; few fine and medium roots; very strongly acid; clear wavy boundary.

Bt1—12 to 16 inches; yellowish brown (10YR 5/6) silty clay loam; common fine prominent reddish yellow (7.5YR 6/8) mottles; strong medium angular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—16 to 35 inches; yellowish brown (10YR 5/4) silty clay; common medium distinct light gray (10YR 7/2) and common coarse prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

BC—35 to 39 inches; light brownish gray (10YR 6/2) silty clay loam; many coarse prominent strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; friable; few distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

C—39 to 56 inches; mottled light gray (10YR 7/2), strong brown (7.5YR 5/8), and white (10YR 8/2) silt loam; massive; friable; very strongly acid; abrupt smooth boundary.

Cr—56 to 65 inches; moderately hard bedrock that crushes to silt loam.

The combined thickness of the A and B horizons commonly ranges from 20 to 40 inches. The depth to soft bedrock is typically 40 to 60 inches, and the depth to hard bedrock is more than 60 inches. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 4.

The E horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 2 to 4. It is silt loam or loam.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 1 to 8, or it is mottled in shades of brown, yellow, or gray. It has mottles with chroma of 2 or less in the upper 10 inches. It is silty clay loam, silty clay, or clay.

The BC horizon has hue of 7.5YR to 5Y, value of 5 to 7, and chroma of 1 to 8, or it is mottled in shades of gray, brown, or yellow. It is silty clay loam, clay loam, or loam.

The C horizon varies in color. It is silt loam or silty clay loam.

The Cr horizon is dominated by multicolored, soft schist bedrock that crushes to silt loam.

Masada Series

The Masada series consists of deep, well drained soils that formed in old alluvial sediments on the high, stable landscape positions of the Piedmont uplands in the extreme northeastern part of the county. Slopes range from 2 to 15 percent.

Masada soils are commonly adjacent to the lower mapped areas of Chewacla and Tetotum soils. Chewacla soils are loamy and are somewhat poorly drained. Tetotum soils have more than 30 percent silt in the argillic horizon and are moderately well drained.

Typical pedon of Masada fine sandy loam, 2 to 8 percent slopes; 0.9 mile east of Glendon on Secondary Road 1629, about 125 feet south of the railroad track that parallels Secondary Road 1629, about 300 feet east, in a cultivated field (State plane coordinates 1,880,800 feet E., 631,600 feet N.):

Ap—0 to 9 inches; yellowish brown (10YR 5/6) fine sandy loam; moderate medium granular structure; friable, nonsticky and nonplastic; many fine roots; about 5 percent, by volume, medium and coarse gravel; slightly acid; clear smooth boundary.

Bt1—9 to 13 inches; yellowish red (5YR 5/8) clay loam;

moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; strongly acid; clear smooth boundary.

Bt2—13 to 32 inches; red (2.5YR 4/8) clay; few fine prominent brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; few fine black concretions; strongly acid; gradual wavy boundary.

Bt3—32 to 45 inches; red (2.5YR 4/8) clay loam; many medium prominent strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; very strongly acid; gradual wavy boundary.

C1—45 to 48 inches; mottled strong brown (7.5YR 5/8), red (2.5YR 4/8), brownish yellow (10YR 6/8), and very pale brown (10YR 7/3) sandy clay loam; massive; friable; very strongly acid; clear wavy boundary.

C2—48 to 60 inches; mottled strong brown (7.5YR 5/8), red (2.5YR 4/6), reddish yellow (7.5YR 7/8), and very pale brown (10YR 7/3) gravelly sandy clay loam; massive; friable; about 20 percent, by volume, medium or coarse gravel; very strongly acid.

The thickness of the solum ranges from 40 to 60 inches. The depth to bedrock is more than 6 feet. The content of silt is less than 30 percent and the content of clay is 35 to 55 percent in the particle-size control section. The content of rounded gravel is less than 15 percent, by volume. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 7.5YR to 2.5Y, value of 3 to 8, and chroma of 1 to 8.

The BE horizon, if it occurs, has hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. It is loam, sandy clay loam, or clay loam.

The Bt horizon dominantly has hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. The uppermost part does not have hue of 2.5YR. Mottles that have high chroma are commonly present. The texture is clay loam, sandy clay, clay, or their gravelly analogs.

The BC horizon, if it occurs, has colors similar to those of the Bt horizon. It also can be mottled in shades of red, brown, or yellow. It is clay loam, sandy clay loam, or sandy clay.

The C horizon is commonly mottled in shades of red, brown, or yellow. It is sandy loam, clay loam, or their gravelly analogs.

Mayodan Series

The Mayodan series consists of well drained soils on Piedmont uplands. These soils formed in material weathered from Triassic rocks. Slopes range from 2 to 25 percent.

Mayodan soils are commonly adjacent to Creedmoor, Hallison, Iredell, Mooshaunee, and Pinkston soils. Creedmoor soils are moderately well drained and somewhat poorly drained, and Iredell soils are moderately well drained. These soils have a more slowly permeable subsoil than that of the Mayodan soils. Hallison soils have soft bedrock within a depth of 40 to 60 inches. Mooshaunee soils have soft bedrock within a depth of 20 to 40 inches. Pinkston soils have hard bedrock within a depth of 20 to 40 inches.

Typical pedon of Mayodan fine sandy loam, 2 to 8 percent slopes; 2 miles northeast of Carthage on Secondary Road 1651, about 50 feet north of Secondary Road 1651, in a wooded area (State plane coordinates 1,832,300 feet E., 587,000 feet N.):

Ap—0 to 7 inches; brown (7.5YR 5/4) fine sandy loam; weak fine granular structure; very friable; many fine and large roots; strongly acid; abrupt smooth boundary.

Bt1—7 to 14 inches; yellowish red (5YR 4/6) silty clay loam; common fine distinct strong brown (7.5YR 5/6) mottles; moderate fine subangular blocky structure; friable, slightly sticky and slightly plastic; common fine and large roots; very strongly acid; clear smooth boundary.

Bt2—14 to 26 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; few faint clay films on vertical faces of peds; common fine and large roots; very strongly acid; clear wavy boundary.

Bt3—26 to 37 inches; reddish brown (2.5YR 4/4) silty clay loam; common medium distinct red (2.5YR 4/6) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; few fine roots; very strongly acid; clear wavy boundary.

Bt4—37 to 51 inches; red (2.5YR 4/6) silty clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few distinct clay films on faces of peds; few fine roots; very strongly acid; clear smooth boundary.

Cr1—51 to 76 inches; reddish brown (5YR 4/4) soft bedrock that crushes to fine sandy loam; common fine distinct red (2.5YR 5/6) and common fine prominent white (10YR 8/1) mottles; common medium distinct strong brown (7.5YR 5/8) and red (2.5YR 4/6) mottles in fracture zones; massive; firm; very strongly acid; abrupt smooth boundary.

Cr2—76 to 99 inches; reddish brown (2.5YR 4/4) soft bedrock that crushes to fine sandy loam; black

coatings along seams and fractures; massive; firm; very strongly acid.

The thickness of the solum ranges from 30 to 60 inches. The depth to soft bedrock is more than 48 inches. Reaction is very strongly acid to moderately acid, except where the surface layer has been limed. The content of coarse fragments of gravel size ranges from 0 to 10 percent, by volume, in the A or Ap and E horizons and from 0 to 5 percent, by volume, in the Bt horizon. Few or common flakes of mica are in some pedons.

The A or Ap horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 2 to 6.

The E horizon, if it occurs, has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 3 to 6. It is fine sandy loam or sandy loam.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 3 to 8. Mottles in shades of red, brown, or yellow are present in most pedons. It is silty clay, silty clay loam, clay, or clay loam. The content of clay by weighted average in the particle-size control section is more than 35 percent.

The BC horizon, if it occurs, has hue of 2.5YR to 7.5YR, value of 3 to 6, and chroma of 2 to 8. It is silty clay loam, clay loam, or loam.

The C horizon, if it occurs, has hue of 2.5YR to 7.5YR, value of 3 to 6, and chroma of 2 to 8. It is weathered saprolite of Triassic sedimentary rocks that crushes to loam, fine sandy loam, or silt loam.

The Cr horizon has hue of 2.5YR to 7.5YR, value of 3 to 8, and chroma of 1 to 8 and has mottles in shades of red, white, brown, or yellow. It is soft bedrock that crushes to fine sandy loam or silt loam.

Mooshaunee Series

The Mooshaunee series consists of moderately well drained, moderately slowly permeable soils on Piedmont uplands. These soils formed in material weathered from fine grained Triassic rocks. Slopes are commonly 2 to 15 percent but range to 25 percent.

Mooshaunee soils are commonly adjacent to Creedmoor, Hallison, Iredell, Mayodan, and Pinkston soils. Creedmoor, Iredell, and Mayodan soils are clayey and do not have a Cr horizon within a depth of 48 inches. Hallison soils have a Cr horizon at a depth of 40 to 60 inches. Pinkston soils are coarse-loamy and have hard bedrock at a depth of 20 to 40 inches.

Typical pedon of Mooshaunee silt loam, in an area of Mooshaunee-Hallison complex, 2 to 8 percent slopes; about 8 miles north of Carthage on Secondary Road 1640, about 0.1 mile south on Secondary Road 1640 from its intersection with Secondary Road 1639, about 60 feet east of Secondary Road 1640 on a logging road, 50 feet south of the logging road, in a loblolly pine forest (State plane coordinates 1,870,750 feet E., 616,400 feet N.):

A—0 to 3 inches; yellowish brown (10YR 5/4) silt loam; weak medium granular structure; friable; common medium roots; very strongly acid; abrupt smooth boundary.

E—3 to 10 inches; very pale brown (10YR 7/4) silt loam; moderate medium granular structure; friable; common fine roots; strongly acid; clear smooth boundary.

Bt1—10 to 18 inches; brownish yellow (10YR 6/8) silty clay loam; many medium distinct very pale brown (10YR 7/4) mottles; moderate medium subangular blocky structure; friable; few fine roots; very strongly acid; clear smooth boundary.

Bt2—18 to 29 inches; yellowish brown (10YR 5/8) silty clay loam; common medium distinct pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; firm; few fine roots; few fine black concretions; very strongly acid; clear smooth boundary.

Bt3—29 to 34 inches; strong brown (7.5YR 5/8) silty clay loam; common medium prominent light gray (10YR 7/2) and reddish brown (5YR 4/4) mottles; moderate medium subangular blocky structure; firm; few fine roots; few fine black concretions; very strongly acid; gradual wavy boundary.

Bt4—34 to 37 inches; reddish brown (5YR 4/4) silty clay loam; common medium prominent light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; firm; few medium black concretions; strongly acid; clear wavy boundary.

Cr—37 to 60 inches; dark reddish brown (5YR 3/3) siltstone that crushes with moderate pressure to silt loam; common medium distinct light gray (7.5YR 7/0) mottles in soil material between the fracture zones.

The thickness of the solum and the depth to soft bedrock range from 20 to 40 inches. Reaction is extremely acid to strongly acid, except where the surface layer has been limed. The content of coarse fragments ¼ inch to 10 inches in size ranges from 0 to 5 percent in the A and Bt horizons. Some pedons have as much as 5 percent iron and manganese concretions.

The Ap or A horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 6.

The E horizon has hue of 7.5YR or 10YR, value of 6 or 7, and chroma of 3 to 8. It is silt loam, fine sandy loam, very fine sandy loam, or loam.

The BE horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8. It is loam, silt loam, fine sandy loam, or silty clay loam.

The Bt horizon has hue of 5YR to 10YR, value of 4 to 7, and chroma of 4 to 8. It has mottles in shades of brown, yellow, red, or gray. It is silty clay loam or clay loam. The particle-size control section has 18 to 34 percent clay and less than 15 percent fine sand or coarser sand.

The BC or CB horizon, if it occurs, has colors similar to those of the Bt horizon. It is silty clay loam, clay loam, or silt loam.

The C horizon, if it occurs, generally has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8 and has mottles in shades of red, brown, yellow, or gray. In some pedons it has no dominant matrix color and is mottled with these colors. It is silt loam, very fine sandy loam, fine sandy loam, or loam.

The Cr horizon has hue of 10R to 7.5YR, value of 3 to 6, and chroma of 2 to 8. It is soft bedrock that crushes to silt loam, loam, or fine sandy loam. The R horizon, if it occurs, is Triassic sedimentary rock.

Nason Series

The Nason series consists of well drained soils on Piedmont uplands. These soils formed in material weathered from metamorphic rocks. Slopes range from 2 to 25 percent.

Nason soils are commonly adjacent to Georgeville, Goldston, Iredell, Lignum, and Tatum soils. Georgeville soils have kaolinitic mineralogy. They are deeper to soft bedrock than the Nason soils. Goldston soils are loamy-skeletal. Iredell soils are moderately well drained, and Lignum soils are somewhat poorly drained. Tatum soils have a redder subsoil than that of the Nason soil.

Typical pedon of Nason silt loam, 2 to 8 percent slopes; about 3 miles east of Robbins on Secondary Road 1477, about 0.4 mile south on Secondary Road 1477 from its intersection with Secondary Road 1489, about 0.1 mile southwest of Secondary Road 1477 along a farm lane, about 50 feet southeast, in a cultivated field (State plane coordinates 1,841,750 feet E., 606,125 feet N.):

Ap—0 to 10 inches; yellowish brown (10YR 5/4) silt loam; weak medium granular structure; very friable; common fine roots; about 5 percent slate fragments; slightly acid; clear smooth boundary.

Bt1—10 to 26 inches; strong brown (7.5YR 5/8) silty clay loam; few fine distinct yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; friable, sticky and plastic; few faint clay films on faces of peds; few fine roots; very strongly acid; gradual wavy boundary.

Bt2—26 to 37 inches; strong brown (7.5YR 5/8) silty clay loam; few fine distinct brownish yellow (10YR 6/8) and common fine prominent red (2.5YR 5/8) mottles; moderate medium subangular blocky structure; friable, sticky and plastic; few faint clay films on faces of peds; few fine roots; very strongly acid; gradual wavy boundary.

BC—37 to 47 inches; mottled strong brown (7.5YR 5/8), red (2.5YR 5/8), brownish yellow (10YR 6/8), light gray (7.5YR 7/0), and light bluish gray (5B 7/1) silt loam; weak fine subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; very strongly acid; gradual wavy boundary.

Cr—47 to 72 inches; mottled brownish yellow (10YR 6/6), red (2.5YR 5/8), light bluish gray (5B 7/1), dark bluish gray (5B 4/1), and white (10YR 8/1) soft bedrock that crushes to silt loam; massive; very friable; very strongly acid.

The thickness of the solum ranges from 25 to 50 inches. The depth to soft bedrock ranges from 40 to 60 inches. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4.

The E horizon, if it occurs, has hue of 10YR, value of 6, and chroma of 4 to 6. It is silt loam or loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 to 8. It has mottles in shades of yellow, red, or brown. It is silty clay, clay, or silty clay loam.

The BC horizon dominantly has hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8, or it has hue of 5B and is mottled in shades of these colors. It is silt loam or silty clay loam.

The C horizon, if it occurs, is commonly mottled in shades of brown or red. It is silt loam or loam.

The Cr horizon is soft bedrock that crushes to silt loam or channery silt loam. It is commonly mottled in shades of yellow, brown, red, gray, or white.

Pactolus Series

The Pactolus series consists of moderately well drained and somewhat poorly drained soils on stream terraces along James Creek and the Little River. These soils formed in coarse textured fluvial sediments. Slopes range from 0 to 3 percent.

Pactolus soils are commonly adjacent to Bibb, Johns, Kalmia, and Kenansville soils. Bibb soils are on flood plains. Johns, Kalmia, and Kenansville soils have a Bt horizon.

Typical pedon of Pactolus sand, 0 to 3 percent slopes; 4 miles east of Mt. Pleasant on Secondary Road 1001, about 0.6 mile south of Secondary Road 1001, about 0.2 mile east of Becker sand pit, on a

terrace along the Little River (State plane coordinates 1,970,150 feet E., 518,252 feet N.):

Ap—0 to 4 inches; grayish brown (10YR 5/2) sand; single grained; loose; few fine roots; very strongly acid; clear smooth boundary.
C1—4 to 27 inches; brownish yellow (10YR 6/6) sand; few fine distinct brownish yellow (10YR 6/8) mottles; single grained; loose; few fine roots; very strongly acid; clear smooth boundary.
C2—27 to 42 inches; brownish yellow (10YR 6/8) sand; few fine prominent light gray (10YR 7/2) and very pale brown (10YR 7/3) mottles; single grained; loose; few fine roots; 10 to 15 percent gravel; very strongly acid; gradual wavy boundary.
C3—42 to 80 inches; light yellowish brown (10YR 6/4) sand; common fine distinct light gray (10YR 7/2) mottles; single grained; loose; 10 to 15 percent gravel; very strongly acid.

The sandy material is more than 80 inches thick. Reaction is extremely acid to strongly acid, except where the surface layer has been limed.

The Ap or A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3.

The upper part of the C horizon has hue of 10YR, value of 6 to 8, and chroma of 3 to 8. The lower part has hue of 10YR, value of 5 to 8, and chroma of 1 to 4. It is sand or loamy sand.

Pinkston Series

The Pinkston series consists of well drained to excessively drained soils in the northeastern part of the county. These soils formed in material weathered from coarse grained Triassic rocks. They are on strongly dissected uplands of the southern Piedmont in the Triassic Basin. Slopes range from 8 to 40 percent.

Pinkston soils are commonly adjacent to Creedmoor, Hallison, Iredell, Mayodan, and Mooshaunee soils. Creedmoor, Iredell, and Mayodan soils have a clayey subsoil and do not have bedrock within a depth of 60 inches. They are less permeable than the Pinkston soils. Hallison and Mooshaunee soils are fine-silty. Hallison soils have soft bedrock within a depth of 40 to 60 inches, and Mooshaunee soils have soft bedrock within a depth of 20 to 40 inches.

Typical pedon of Pinkston silt loam, 15 to 40 percent slopes; about 6.5 miles northeast of Carthage on Secondary Road 1658, about 900 feet north of the Governors Creek bridge on Secondary Road 1658, about 50 feet west of Secondary Road 1658, on a south-facing slope in a wooded area (State plane coordinates 1,899,000 feet E., 608,750 feet N.):

Oi—1 inch to 0; mixture of undecomposed and partly decomposed leaves and twigs.
A—0 to 6 inches; dark brown (10YR 4/3) silt loam; moderate fine granular structure; friable; many fine and medium roots; about 5 percent gravel- and cobble-sized rock fragments; very strongly acid; clear smooth boundary.
Bw1—6 to 10 inches; brown (7.5YR 4/4) fine sandy loam; weak fine subangular blocky structure; friable; many fine and medium roots; about 5 percent gravel- and cobble-sized rock fragments; strongly acid; clear smooth boundary.
Bw2—10 to 31 inches; reddish brown (5YR 4/3) sandy loam; irregularly shaped bodies of reddish brown (5YR 5/4) clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; very strongly acid; clear wavy boundary.
C—31 to 36 inches; dark reddish gray (5YR 4/2) very fine sandy loam; common coarse faint reddish brown (5YR 4/3) and common medium distinct strong brown (7.5YR 5/6) mottles; massive; friable; about 10 percent gravel-sized rock fragments; many uncoated sand grains; very strongly acid; gradual irregular boundary.
R—36 inches; hard mudstone and conglomerate.

The thickness of the solum ranges from 12 to 35 inches. The depth to hard bedrock ranges from 20 to 40 inches. The content of coarse fragments typically is less than 15 percent but ranges from 1 to 35 percent in the A and Bw horizons and from 10 to 50 percent in the C horizon. These consist of small fragments of mudstone, siltstone, and conglomerate. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed.

The A horizon has hue of 5YR to 2.5Y, value of 4 or 5, and chroma of 2 to 4.

The Bw horizon has hue of 2.5YR to 10YR, value of 3 to 7, and chroma of 2 to 8. It is sandy loam, fine sandy loam, very fine sandy loam, loam, or silt loam. The Bw horizon also has discontinuous, irregularly shaped bodies of clay loam or sandy clay loam.

The C horizon has hue of 2.5YR to 10YR, value of 3 to 6, and chroma of 2 to 8. It is fine sandy loam, very fine sandy loam, or sandy loam.

The Cr horizon, if it occurs, has hue of 10R to 7.5YR, value of 3 to 6, and chroma of 2 to 8. It is soft bedrock that crushes to silt loam, loam, or sandy loam.

The R horizon is dark, hard Triassic bedrock.

Tatum Series

The Tatum series consists of well drained soils on Piedmont uplands. These soils formed in material

weathered from metamorphic rocks. Slopes range from 15 to 25 percent.

Tatum soils are commonly adjacent to Georgeville, Goldston, Lignum, and Nason soils. Georgeville soils have kaolinitic mineralogy and do not have a Cr horizon. Goldston soils are loamy-skeletal. Lignum soils are somewhat poorly drained. Nason soils have a Bt horizon with hue of 5YR or 7.5YR.

Typical pedon of Tatum channery silt loam, in an area of Tatum and Nason channery silt loams, 15 to 25 percent slopes; about 0.5 mile east of the Moore-Montgomery County line on Secondary Road 1400, about 0.3 mile northeast of the intersection of Secondary Road 1400 and a logging road, about 200 feet west of the logging road (State plane coordinates 1,783,700 feet E., 626,625 feet N.):

Ap—0 to 5 inches; strong brown (7.5YR 5/6) channery silt loam; weak fine granular structure; very friable; common fine roots; about 20 percent coarse fragments; strongly acid; clear smooth boundary.

Bt—5 to 35 inches; red (2.5YR 5/8) silty clay; few medium distinct reddish yellow (5YR 6/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; very strongly acid; gradual wavy boundary.

BC—35 to 43 inches; red (2.5YR 5/8) silty clay loam; common medium prominent reddish yellow (7.5YR 6/8) mottles; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; gradual wavy boundary.

Cr—43 to 60 inches; mottled red (2.5YR 5/8), brownish yellow (10YR 6/8), reddish yellow (5YR 6/8), and white (5YR 8/1) soft bedrock that crushes to silt loam; massive; friable; very strongly acid.

The thickness of the solum and the depth to soft bedrock range from 40 to 60 inches. Reaction is very strongly acid or strongly acid, except where the surface layer has been limed. Few flakes of mica are present in some pedons.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 6.

The E horizon, if it occurs, has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 3 or 4. It is silt loam, channery silt loam, or loam.

The Bt horizon has hue of 10R or 2.5YR, value of 4 or 5, and chroma of 6 to 8. It has mottles in shades of yellow, brown, or red. It is silty clay loam, silty clay, or clay.

The BC horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 6 to 8. It has mottles in shades of yellow, brown, or red. It is silty clay loam or silt loam.

The C horizon, if it occurs, has hue of 10R or 2.5YR, value of 4 to 6, and chroma of 1 to 8, or it is mottled in these colors. It is silt loam or loam.

The Cr horizon has hue of 10R to 10YR, value of 4 to 8, and chroma of 1 to 8, or it is mottled in shades of these colors. It is soft bedrock that crushes to silt loam.

Tetotum Series

The Tetotum series consists of moderately well drained soils on stream terraces. These soils formed in moderately fine textured fluvial sediments. Slopes range from 0 to 3 percent.

Tetotum soils are commonly adjacent to Chewacla, Congaree, Masada, and Wehadkee soils. Chewacla soils are somewhat poorly drained. Congaree soils do not have a Bt horizon. Masada soils have more clay than the Tetotum soils. Wehadkee soils are poorly drained.

Typical pedon of Tetotum silt loam, 0 to 3 percent slopes, rarely flooded; about 0.2 mile west on Secondary Road 1642 from its intersection with Secondary Road 1644, about 1,000 feet west of a bridge, about 500 feet south of Secondary Road 1642 (State plane coordinates 1,870,600 feet E., 600,350 feet N.):

Ap—0 to 4 inches; brown (10YR 4/3) silt loam; moderate medium granular structure; very friable; many large and fine roots; very strongly acid; clear smooth boundary.

BE—4 to 9 inches; brownish yellow (10YR 6/8) silt loam; weak fine subangular blocky structure; very friable; many large and fine roots; very strongly acid; clear wavy boundary.

Bt1—9 to 21 inches; brownish yellow (10YR 6/8) silty clay loam; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; few medium and fine roots; very strongly acid; clear wavy boundary.

Bt2—21 to 30 inches; yellowish brown (10YR 5/8) silty clay loam; common medium prominent red (2.5YR 5/8), few fine distinct strong brown (7.5YR 5/8), and few medium distinct brown (10YR 5/3) mottles; strong medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; very strongly acid; clear wavy boundary.

Bt3—30 to 44 inches; strong brown (7.5YR 5/8) silty clay loam; common medium distinct pinkish gray (7.5YR 7/2) mottles; firm, slightly sticky and slightly plastic; few fine roots; very strongly acid; clear wavy boundary.

C—44 to 70 inches; yellowish red (5YR 5/8) silt loam; common medium distinct red (2.5YR 5/8) and pinkish gray (7.5YR 6/2) and common fine faint light

reddish brown (5YR 6/4) mottles; massive; friable; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. Reaction is extremely acid to strongly acid, except where the surface layer has been limed. The upper 20 inches of the argillic horizon averages more than 30 percent silt or more than 40 percent silt plus very fine sand.

The A or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4.

The E horizon, if it occurs, has hue of 10YR to 2.5Y, value of 4 to 6, and chroma of 2 to 4. It is fine sandy loam or silt loam.

The BE horizon has hue of 10YR, value of 4 to 6, and chroma of 3 to 8. It is silt loam, fine sandy loam, or loam.

The upper part of the Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. The lower part has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 1 to 8, or it is mottled. It has high- and low-chroma mottles. The texture is silty clay loam, loam, sandy clay loam, or clay loam. The content of clay by weighted average in the particle-size control section is 18 to 34 percent. The particles are 15 percent or more, by weight, fine sand or coarser material.

The C or 2C horizon has hue of 5YR to 2.5Y, value of 4 to 8, and chroma of 1 to 8, or it is mottled. It ranges from sand to sandy clay loam.

Vaucluse Series

The Vaucluse series consists of well drained soils on Coastal Plain uplands. These soils formed in moderately fine textured Coastal Plain sediments. Slopes range from 2 to 25 percent.

Vaucluse soils are commonly adjacent to Ailey, Candor, Dothan, Fuquay, and Gilead soils. Ailey, Candor, and Fuquay soils have sandy surface and subsurface layers more than 20 inches thick. Dothan soils have plinthite in the lower part of the Bt horizon. Gilead soils have a clayey subsoil and are moderately well drained.

Typical pedon of Vaucluse loamy sand, 8 to 15 percent slopes; about 1.1 miles south on Secondary Road 2075 from its intersection with Secondary Road 2074, about 100 feet east of Secondary Road 2075, in a wooded area (State plane coordinates 1,887,250 feet E., 503,000 feet N.):

A—0 to 7 inches; brown (10YR 5/3) loamy sand; weak medium granular structure; very friable; common fine roots; very strongly acid; clear smooth boundary.

E—7 to 13 inches; yellowish brown (10YR 5/4) loamy sand; weak medium granular structure; very friable; few fine roots; very strongly acid; clear wavy boundary.

Bt—13 to 26 inches; strong brown (7.5YR 5/8) sandy clay loam; common medium distinct yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; few faint clay skins on vertical faces of peds; very strongly acid; gradual wavy boundary.

Btx—26 to 50 inches; reddish yellow (7.5YR 7/8) sandy clay loam; common medium distinct yellowish red (5YR 5/8) mottles; moderate coarse subangular blocky structure; very firm and compact, dense, brittle in 20 to 30 percent; few fine roots; few faint clay skins on vertical faces of peds; few pockets of kaolin less than 1 inch in diameter; few fine platelike fragments of indurated ironstone ¼ inch to 2 inches across; few small rounded quartz fragments; very strongly acid; gradual wavy boundary.

Cx—50 to 64 inches; mottled very pale brown (10YR 8/4) and reddish yellow (7.5YR 7/8) sandy loam with pockets of light gray (10YR 7/2) uncoated coarse sand; massive; very firm and compact, dense; few quartz and ironstone nodules; very strongly acid; gradual irregular boundary.

C—64 to 80 inches; very pale brown (10YR 8/4) fine sand; single grained; loose; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. The depth to a brittle horizon ranges from 20 to 35 inches. Reaction is very strongly acid or strongly acid in the A and E horizons, except where limed, and extremely acid to strongly acid in the B and C horizons.

The A or Ap horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4.

The E horizon has hue of 10YR, value of 4 to 7, and chroma of 3 to 6. It is sandy loam, loamy sand, or their gravelly analogs.

The Bt and Btx horizons have hue of 2.5YR to 7.5YR, value of 4 to 7, and chroma of 4 to 8. In most pedons they have mottles, which are generally attributed to the pockets of white kaolin in the lower horizons. The texture is sandy clay or sandy clay loam. The content of clay by weighted average in the particle-size control section ranges from 18 to 34 percent. Brittle zones are present in the Btx horizon.

The C or Cx horizon has hue of 2.5YR to 10YR and value and chroma of 4 to 8. It either has mottles or is massive with dense, brittle zones in part of the C horizon. The texture is sand, fine sand, sandy loam, or loamy sand.

Wehadkee Series

The Wehadkee series consists of poorly drained soils on flood plains of the Coastal Plain and Piedmont. These soils formed in recent alluvial sediments. Slopes range from 0 to 2 percent.

Wehadkee soils are commonly adjacent to Chewacla and Congaree soils. Chewacla soils are somewhat poorly drained. Congaree soils are well drained and moderately well drained.

Typical pedon of Wehadkee loam, 0 to 2 percent slopes, frequently flooded; about 5.7 miles south of Carthage on North Carolina Highway 22, about 200 feet west of North Carolina Highway 22, in an idle area of pasture (State plane coordinates 1,875,625 feet E., 552,800 feet N.):

Ap—0 to 6 inches; grayish brown (10YR 5/2) loam; common fine prominent yellowish red (5YR 5/8) mottles; weak medium granular structure; very friable; many fine roots; few fine flakes of mica; slightly acid; clear smooth boundary.

Bg1—6 to 15 inches; grayish brown (10YR 5/2) loam; common fine distinct strong brown (7.5YR 5/6) and common fine prominent yellowish red (5YR 5/8) mottles; weak medium subangular blocky structure; very friable; few fine roots; few fine flakes of mica; slightly acid; gradual wavy boundary.

Bg2—15 to 52 inches; light brownish gray (10YR 6/2) sandy clay loam; many medium distinct strong brown (7.5YR 5/8) and common fine prominent yellowish red (5YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine roots; few fine flakes of mica; moderately acid; gradual wavy boundary.

Cg—52 to 62 inches; light gray (10YR 7/1) sandy loam; few fine distinct brownish yellow (10YR 6/6) mottles; massive; very friable; few fine flakes of mica; strongly acid.

The thickness of the loamy horizons ranges from 30 to more than 60 inches. Flakes of mica are present throughout the soil. Reaction is very strongly acid to slightly acid, except where the surface layer has been limed.

The A or Ap horizon has hue of 10YR to 2.5Y, value of 4 to 6, and chroma of 1 or 2.

The Bg horizon is neutral in hue and has value of 4 to 6, or it has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. Mottles are in shades of yellow or brown or, less commonly, red. The texture is sandy clay loam, clay loam, loam, or silt loam.

The Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 0 to 2, or it is mottled. Mottles are in shades of brown, yellow, or red. It is commonly sandy loam or loam, but some pedons contain stratified layers of clay loam, sand, and gravel.

Formation of the Soils

This section provides general information about formation of the soils. It describes the soil-forming processes and the various geologic materials associated with the soils in Moore County.

Factors of Soil Formation

Soils are formed by the processes of the environment acting on the geologic materials exposed at the earth's surface. The geologic material is generally referred to as parent material, and the environmental processes are climate, plant and animal life, relief, and time. All of these factors affect the formation of every soil. In many places, however, one or two factors are dominant and influence most of the properties of the soil *(6)*.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. The three types of parent material in Moore County are residual materials, Coastal Plain deposits, and alluvial materials deposited by stream waters.

In the northern part of the county, the parent material of residual soils is derived from the physical and chemical breakdown of slate rocks known as "Carolina slates." Nason, Georgeville, Goldston, and Tatum soils are dominant in this group. Also included is the Triassic Basin, which consists of Triassic rocks, such as shales, sandstones, mudstones, siltstones, and conglomerates *(8)*. Mayodan, Mooshaunee, Hallison, Pinkston, and Creedmoor soils are derived from these rock materials.

The southern part of the county is underlain by Coastal Plain deposits, which are deposits of various sediments from the ocean. The clayey sediments are the parent material of Gilead soils. The loamy sediments are the parent material of Ailey, Dothan, Fuquay, Kenansville, and Vaucluse soils. Candor and Pactolus soils formed in sandy deposits.

The transported parent material mainly includes sediments deposited by stream waters. The most recent alluvium consists of material that has been changed very little by the soil-forming processes. Chewacla, Congaree, and Wehadkee soils formed in recent alluvium. They are on flood plains along the larger streams and the smaller streams. The older alluvium consists of material that has been changed by the soil-forming processes. Johns, Kalmia, Masada, and Tetotum soils formed in the older alluvium. Johns, Kalmia, and Tetotum soils are on terraces, generally slightly above the level of the flood plain. Masada soils, however, are on old terraces on the higher landscapes.

Climate

Climate affects soil formation primarily through the influence of precipitation and temperature. Precipitation is necessary for biological activity. It also dissolves minerals and moves them downward through the soil profile. The kinds and growth of organisms and the speed and extent of chemical and physical reactions in the soil are greatly influenced by temperature.

Moore County has a warm, humid climate. This climate favors chemical reactions that result in rapid decomposition of organic matter and decay of parent material, and thus enhances the development of soils. The breakdown of organic matter is slower in the wetter soils, such as Bibb soils; the wet soils, therefore, have a dark surface layer that has a higher content of organic matter. The abundant rainfall leaches soluble bases and carries the finer textured mineral particles downward. As a result, the mineral soils in the county are acid, highly weathered, and highly leached.

Plant and Animal Life

Plants and animals are active in soil development. Simple organisms, such as bacteria and fungi, increase the rate at which rocks weather and organic matter decomposes. Plants and animals produce organic matter and translocate elements and material within the soil.

Plants provide cover and protection for the soils. Old rootholes are channels for air and water. Before the nutrients can be leached past the root zone, they are absorbed by roots. As plants die, nutrients that can be used by new growth are released to the surface by the decaying debris.

Relief

Relief influences runoff, erosion, drainage, aeration, and exposure to sun and wind. The soils in Moore County range from nearly level to steep. In areas where geologic erosion removes the soil material as it forms, shallow to moderately deep soils are present, such as Goldston, Pinkston, and Tatum soils in the Piedmont region and Vaucluse, Gilead, and Ailey soils in the Sandhills or Coastal Plain region. The nearly level and gently sloping soils, such as Georgeville and Mayodan soils in the Piedmont region and Candor, Fuquay, and Dothan soils in the Sandhills or Coastal Plain region, are deeper than the steeper soils. Relief also affects the natural drainage of the soils. As a result, it strongly influences the accumulation of organic matter in the soils.

Time

The development of a sequence of horizons in a natural soil takes a long time. Horizons are more strongly defined in an older soil than in a younger soil, assuming that both soils formed under the same conditions and in similar parent material.

The older soils in Moore County formed on the nearly level and gently sloping upland divides. These soils have well developed horizons. Examples are Nason, Mayodan, Fuquay, and Dothan soils. In contrast, the soils on flood plains, such as Chewacla, Bibb, and Congaree soils, formed in alluvial material. These soils have not been in place long enough to have developed well defined horizons.

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Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but that have different characteristics as a result of differences in relief and drainage.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Channery soil material. Soil material that is, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clayey. A general textural term that includes sandy clay, silty clay, and clay. According to family level criteria in the soil taxonomic system, a specific textural name referring to fine earth (particles less than 2 millimeters in size) containing 35 percent or more clay, by weight, within the control section. The content of rock fragments is less than 35 percent, by volume.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

CMAI (cumulative mean annual increment). The age or rotation at which growing stock of a forest produces the greatest annual growth (for that time period). It is the age at which periodic annual growth and mean annual growth are equal.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coastal Plain. The physiographic region of eastern North Carolina that consists of ocean-deposited sediments of sand, silt, and clay. These areas of sediments are level to rolling and vary in thickness.

Coefficient of linear extensibility (COLE). The ratio of the difference between the moist and dry lengths of a soil clod to its dry length. The measurement correlates with the volume change upon wetting and drying.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Dbh (diameter at breast height). The diameter of a tree at 4.5 feet above the ground level on the uphill side.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Depth class. Refers to the depth to a root-restricting layer. Unless otherwise stated, this layer is understood to be consolidated bedrock. The depth classes in this survey are:

Very shallow	less than 10 inches
Shallow	10 to 20 inches
Moderately deep	20 to 40 inches
Deep	40 to 60 inches
Very deep	more than 60 inches

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Dike. A long, narrow, crosscutting mass of igneous rock that extends to or crops out on the land surface.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused

by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as fire, that exposes the surface.

Erosion classes. Classes based on estimates of past erosion. The classes are as follows:

Class 1.—Soils that have lost some of the original A horizon but on the average less than 25 percent of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick). Throughout most of the area, the thickness of the surface layer is within the normal range of variability of the uneroded soil. Class 1 erosion typically is not designated in the name of the map unit or in the map symbol.

Class 2.—Soils that have lost an average of 25 to 75 percent of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick). Throughout most cultivated areas of class 2 erosion, the surface layer consists of a mixture of the original A horizon and material from below. Some areas may have intricate patterns ranging from uneroded spots to spots where all of the original A horizon has been removed.

Class 3.—Soils that have lost an average of 75 percent or more of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick). In most cultivated areas of class 3 erosion, material that was below the original A horizon is exposed. The plow layer consists entirely or largely of this material.

Class 4.—Soils that have lost all of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick) plus some or all of the deeper horizons throughout most of the area. The original soil can be identified

only in spots. Some areas may be smooth, but most have an intricate pattern of gullies.

Erosion hazard. Terms describing the potential for future erosion, inherent in the soil itself, in inadequately protected areas. The following definitions are based on estimated annual soil loss in tons per acre (values determined by the Universal Soil Loss Equation assuming bare soil conditions and using rainfall and climate factors for North Carolina):

0 tons per acre	none
Less than 1 ton per acre	slight
1 to 5 tons per acre	moderate
5 to 10 tons per acre	severe
More than 10 tons per acre	very severe

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flooding. The temporary covering of the surface by flowing water from any source, such as overflowing streams, runoff from adjacent or surrounding slopes, and inflow from high tides. The frequency of flooding generally is expressed as none, rare, occasional, or frequent. *None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year). *Frequent* means that flooding occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). The duration of flooding is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month).

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; growing or living in streams or ponds; produced by river action, as a fluvial plain.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of the material below the water table.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is, in part, a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as accumulation of clay, sesquioxides, humus, or a combination of these; prismatic or blocky structure; redder or browner colors than those in the A horizon; or a combination of these. The combined A and B horizons are generally called the solum, or true

soil. If a soil does not have a B horizon, the A horizon alone is the solum.
C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Arabic numeral 2 precedes the letter C.
Cr layer.—Consolidated rock (weathered bedrock) beneath the soil that can be dug with difficulty by hand tools. The soft bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.
R layer.—Consolidated rock (unweathered bedrock) beneath the soil. The hard bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material. This contrasts with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:
Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.
Sprinkler.—Water is sprayed over the surface through pipes or nozzles from a pressure system.

Kaolinite. An aluminosilicate clay mineral with a 1:1 layer structure; that is, a silicon tetrahedral sheet alternating with an aluminum octahedral sheet. Little or no expansion occurs when water mixes with the clay.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loamy. A general textural term that includes coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, clay loam, sandy clay loam, and silty clay loam. According to family level criteria in the soil taxonomic system, a specific textural name referring to fine earth (particles less than 2 millimeters in size) of loamy very fine sand or finer textured material that contains less than 35 percent clay, by weight, within the control section. The content of rock fragments is less than 35 percent, by volume.

Low strength. The soil is not strong enough to support loads.

Mean annual increment. The average yearly volume of a stand of trees from the year of origin to the age under consideration.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons,

and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

No-till planting. A method of planting crops in which there is virtually no seedbed preparation. A thin slice of the soil is opened, and the seed is planted at the desired depth.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piedmont. The physiographic region of central North Carolina characterized by rolling landscapes formed from the weathering of residual rock material.

Piping (in tables). Subsurface tunnels or pipelike cavities are formed by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range in moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	below 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Reforestation. The process in which tree seedlings are planted or become naturally established in an area of land that was once forested.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rippable. Rippable bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 drawbar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Runoff class (surface). Refers to the rate at which water flows away from the soil over the surface without infiltrating. Six classes of rate of runoff are recognized:

Ponded.—Little of the precipitation and water that runs onto the soil escapes as runoff, and free water stands on the surface for significant periods. The amount of water that is removed from ponded areas by movement through the soil, by plants, or by evaporation is usually greater than the total rainfall. Ponding normally occurs on level and nearly level soils in depressions. The water depth may fluctuate greatly.

Very slow.—Surface water flows away slowly, and free water stands on the surface for long periods or immediately enters the soil. Most of the water passes through the soil, is used by plants, or evaporates. The soils are commonly level or nearly level or are very porous.

Slow.—Surface water flows away so slowly that free water stands on the surface for moderate periods or enters the soil rapidly. Most of the water passes through the soil, is used by plants, or evaporates. The soils are nearly level or very gently sloping, or they are steeper but absorb precipitation very rapidly.

Medium.—Surface water flows away so rapidly that free water stands on the surface for only short periods. Part of the precipitation enters the soil and is used by plants, is lost by evaporation, or moves into underground channels. The soils are nearly level or gently sloping and absorb precipitation at a moderate rate, or they are steeper but absorb water rapidly.

Rapid.—Surface water flows away so rapidly that the period of concentration is brief and free water does not stand on the surface. Only a small part of the water enters the soil. The soils are mainly moderately steep or steep and have moderate or slow rates of absorption.

Very rapid.—Surface water flows away so rapidly that the period of concentration is very brief and free water does not stand on the surface. Only a small part of the water enters the soil. The soils are mainly steep or very steep and absorb precipitation slowly.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sandy. A general textural term that includes coarse sand, sand, fine sand, very fine sand, loamy coarse sand, loamy sand, loamy fine sand, and loamy very fine sand. According to family level criteria in the soil taxonomic system, a specific textural name referring to fine earth (particles less than 2 millimeters in size) of sand or loamy sand that contains less than 50 percent very fine sand, by weight, within the control section. The content of rock fragments is less than 35 percent, by volume.

Saprolite (soil science). Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Seasonal high water table. The highest level of a saturated zone (the apparent or perched water table) over a continuous period of more than 2 weeks in most years, but not a permanent water table.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All

the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slippage (in tables). The soil mass is susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey area slope classes are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 8 percent
Moderately sloping	6 to 10 percent
Strongly sloping	8 to 15 percent
Moderately steep	15 to 25 percent
Steep	25 to 45 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil compaction. An alteration of soil structure that ultimately can affect the biological and chemical properties of the soil. Compaction decreases the extent of voids and increases bulk density.

Soil map unit. A kind of soil or miscellaneous area or a combination of two or more soils or one or more soils and one or more miscellaneous areas that can be shown at the scale of mapping for the defined purposes and objectives of the soil survey. They are generally designed to reflect significant differences in use and management.

Soil puddling. This condition occurs in certain soils when they are driven over while they are wet. Exertion of mechanical force destroys the soil structure by compressing and shearing and results in the rearrangement of the soil particles to a massive or nonstructural state.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Soil strength. Load supporting capacity of a soil at specific moisture and density conditions.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stand density. The degree to which an area is covered with living trees. It is usually expressed in units of basal area per acre, number of trees per acre, or the percentage of ground covered by the tree canopy as viewed from above.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stripcropping. Growing crops in a systematic

arrangement of strips or bands that provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Suitability ratings. Ratings for the degree of suitability of soils for pasture, crops, woodland, and engineering uses. The ratings and the general criteria used for their selection are as follows:
Well suited.—The intended use may be initiated and maintained by using only the standard materials and methods typically required for that use. Good results can be expected.
Moderately suited.—The limitations affecting the intended use make special planning, design, or maintenance necessary.
Poorly suited.—The intended use is difficult or costly to initiate and maintain because of certain soil properties, such as steep slopes, a high hazard of erosion, a high water table, low fertility, and a hazard of flooding. Major soil reclamation, special design, or intensive management practices are needed.
Very poorly suited, not suited, or unsuited.—The intended use is very difficult or costly to initiate and maintain, and thus it generally should not be undertaken.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed on the contour or at a slight angle to the contour across sloping soils. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine." The textural classes are defined as follows:
Sands (coarse sand, sand, fine sand, and very fine sand).—Soil material in which the content of sand is 85 percent or more and the percentage of silt plus 1.5 times the percentage of clay does not exceed 15.
Loamy sands (loamy coarse sand, loamy sand, loamy fine sand, and loamy very fine sand).—Soil material in which, at the upper limit, the content of sand is 85 to 90 percent and the percentage of silt plus 1.5 times the percentage of clay is not less than 15; at the lower limit, the content of sand is 70 to 85 percent and the percentage of silt plus twice the percentage of clay does not exceed 30.
Sandy loams (coarse sandy loam, sandy loam, fine sandy loam, and very fine sandy loam).—Soil material in which the content of clay is 20 percent or less, the percentage of silt plus twice the percentage of clay exceeds 30, and the content of sand is 52 percent or more or soil material in which the content of clay is less than 7 percent, the content of silt is less than 50 percent, and the content of sand is 43 to 52 percent.
Loam.—Soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand.
Silt loam.—Soil material that contains 50 or more percent silt and 12 to 27 percent clay or 50 to 80 percent silt and less than 12 percent clay.
Silt.—Soil material that contains 80 or more

percent silt and less than 12 percent clay.
Sandy clay loam.—Soil material that contains 20 to 35 percent clay, less than 28 percent silt, and 45 or more percent sand.
Clay loam.—Soil material that contains 27 to 40 percent clay and 20 to 45 percent sand.
Silty clay loam.—Soil material that contains 27 to 40 percent clay and less than 20 percent sand.
Sandy clay.—Soil material that contains 35 or more percent clay and 45 or more percent sand.
Silty clay.—Soil material that contains 40 or more percent clay and 40 or more percent silt.
Clay.—Soil material that contains 40 or more percent clay, less than 45 percent sand, and less than 40 percent silt.

Thin layer (in tables). An otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, such as zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Triassic. The earliest of the three geologic periods comprised in the Mesozoic era; approximately 225 million years ago to 180 million years ago.

Underlying material. Technically the C horizon; the part of the soil below the biologically altered A and B horizons.

Universal Soil Loss Equation. An equation used to design water erosion control systems. The equation is A=RKLSPC wherein A is the average annual soil loss in tons per acre per year, R is the rainfall factor, K is the soil erodibility factor, L is the length of slope, S is the steepness of slope, P is the conservation practice factor, and C is the cropping and management factor.

Unstable fill (in tables). There is a risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variegation. Refers to patterns of contrasting colors that are assumed to be inherited from the parent material rather than to be the result of poor drainage.

Water table (apparent). A thick zone of free water in the soil. The apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table (perched). A saturated zone of water in the soil standing above an unsaturated zone.

Water table (seasonal high). The highest level of a saturated zone in the soil (the apparent or perched water table) over a continuous period of more than 2 weeks in most years, but not a permanent water table.

Water turnouts. Small, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface.

Weathering. All physical and chemical changes produced by atmospheric agents in rocks or other deposits at or near the earth's surface. These changes result in disintegration and decomposition of the material.

Wetness. A general term applied to soils that hold water at or near the surface long enough to be a common management problem.

Windthrow. The uprooting and tipping over of trees by the wind.

Yield (forest land). The volume of wood fiber from harvested trees taken from a certain unit of area. Yield is usually measured in board feet or cubic feet per acre.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1951-78 at Pinehurst, North Carolina)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	51.9	30.8	41.4	76	9	31	3.75	2.32	5.03	7	1.7
February----	56.0	32.9	44.5	77	11	36	4.20	2.49	5.72	8	.9
March-------	63.9	39.5	51.7	85	20	156	4.59	2.93	6.08	8	.9
April-------	75.0	48.5	61.8	92	29	354	3.46	1.77	4.92	7	.0
May---------	82.2	56.4	69.3	96	35	598	4.22	2.28	5.91	7	.0
June--------	87.8	63.6	75.7	100	48	771	4.94	2.92	6.73	8	.0
July--------	90.2	67.4	78.8	100	54	893	5.50	3.06	7.66	9	.0
August------	88.9	66.6	77.8	99	53	862	4.97	2.16	7.36	7	.0
September---	83.7	60.2	72.0	96	42	660	3.92	1.45	5.98	6	.0
October-----	73.8	49.0	61.4	90	27	357	3.38	.94	5.34	4	.0
November----	63.1	39.7	51.4	82	18	98	2.83	1.12	4.26	5	.0
December----	54.0	33.2	43.6	74	11	52	3.60	1.91	5.07	7	1.1
Yearly:											
Average---	72.5	49.0	60.8	---	---	---	---	---	---	---	---
Extreme---	---	---	---	102	8	---	---	---	---	---	---
Total-----	---	---	---	---	---	4,868	49.36	43.22	55.28	83	4.6

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1951-78 at Pinehurst, North Carolina)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Mar. 27	Apr. 2	Apr. 24
2 years in 10 later than--	Mar. 19	Mar. 30	Apr. 18
5 years in 10 later than--	Mar. 5	Mar. 23	Apr. 5
First freezing temperature in fall:			
1 year in 10 earlier than--	Nov. 4	Oct. 23	Oct. 14
2 years in 10 earlier than--	Nov. 9	Oct. 28	Oct. 19
5 years in 10 earlier than--	Nov. 19	Nov. 7	Oct. 28

TABLE 3.--GROWING SEASON

(Recorded in the period 1951-78 at Pinehurst, North Carolina)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	228	210	180
8 years in 10	238	216	189
5 years in 10	258	228	205
2 years in 10	278	240	221
1 year in 10	288	247	229

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
AeB	Ailey loamy sand, 2 to 8 percent slopes	22,112	4.9
AeD	Ailey loamy sand, 8 to 15 percent slopes	31,950	7.2
Bb	Bibb loam, 0 to 2 percent slopes, frequently flooded	19,092	4.2
CaB	Candor sand, 0 to 4 percent slopes	52,236	11.6
CaC	Candor sand, 4 to 12 percent slopes	22,339	4.9
CbC	Candor-Urban land complex, 2 to 12 percent slopes	5,843	1.3
Ch	Chewacla silt loam, 0 to 2 percent slopes, frequently flooded	6,431	1.4
Co	Congaree loam, 0 to 2 percent slopes, frequently flooded	4,996	1.1
CrB	Creedmoor fine sandy loam, 2 to 6 percent slopes	2,355	0.5
CrC	Creedmoor fine sandy loam, 6 to 10 percent slopes	1,096	0.2
DoA	Dothan loamy sand, 0 to 2 percent slopes	1,591	0.4
DoB	Dothan loamy sand, 2 to 6 percent slopes	2,366	0.5
FaB	Fuquay loamy sand, 0 to 6 percent slopes	23,633	5.2
FuB	Fuquay-Urban land complex, 0 to 6 percent slopes	1,405	0.3
GeB	Georgeville gravelly silt loam, 2 to 8 percent slopes	21,822	4.8
GeD	Georgeville gravelly silt loam, 8 to 15 percent slopes	10,930	2.4
GhB	Gilead loamy sand, 2 to 8 percent slopes	8,176	1.8
GhD	Gilead loamy sand, 8 to 15 percent slopes	5,975	1.3
GoC	Goldston very channery silt loam, 2 to 15 percent slopes	8,683	1.9
GoF	Goldston very channery silt loam, 15 to 45 percent slopes	8,749	1.9
IrB	Iredell clay loam, 2 to 6 percent slopes	1,158	0.3
JoA	Johns fine sandy loam, 0 to 2 percent slopes	540	0.1
KaA	Kalmia sandy loam, wet substratum, 0 to 2 percent slopes	948	0.2
KeB	Kenansville loamy sand, 0 to 4 percent slopes	457	0.1
LgB	Lignum silt loam, 2 to 7 percent slopes	7,769	1.7
LgC	Lignum silt loam, 7 to 12 percent slopes	802	0.2
MaB	Masada fine sandy loam, 2 to 8 percent slopes	4,405	1.0
MaD	Masada fine sandy loam, 8 to 15 percent slopes	742	0.2
MdB	Mayodan fine sandy loam, 2 to 8 percent slopes	9,238	2.0
MdD	Mayodan fine sandy loam, 8 to 15 percent slopes	10,587	2.3
MdE	Mayodan fine sandy loam, 15 to 25 percent slopes	3,158	0.7
MoB	Mooshaunee-Hallison complex, 2 to 8 percent slopes	12,768	2.8
MoD	Mooshaunee-Hallison complex, 8 to 15 percent slopes	11,816	2.6
MoE	Mooshaunee-Hallison complex, 15 to 25 percent slopes	1,921	0.4
NaB	Nason silt loam, 2 to 8 percent slopes	22,121	4.9
NaD	Nason silt loam, 8 to 15 percent slopes	25,832	5.8
PaA	Pactolus sand, 0 to 3 percent slopes	740	0.2
PkD	Pinkston silt loam, 8 to 15 percent slopes	4,074	0.9
PkF	Pinkston silt loam, 15 to 40 percent slopes	4,824	1.1
Pt	Pits, quarry	88	*
TnE	Tatum and Nason channery silt loams, 15 to 25 percent slopes	8,403	1.9
ToA	Tetotum silt loam, 0 to 3 percent slopes, rarely flooded	3,942	0.9
Ud	Udorthents, loamy	2,299	0.5
Ur	Urban land	431	0.1
VaB	Vaucluse loamy sand, 2 to 8 percent slopes	6,816	1.5
VaD	Vaucluse loamy sand, 8 to 15 percent slopes	25,716	5.8
VaE	Vaucluse loamy sand, 15 to 25 percent slopes	2,635	0.6
VcB	Vaucluse gravelly sandy loam, 2 to 8 percent slopes	1,574	0.3
VcD	Vaucluse gravelly sandy loam, 8 to 15 percent slopes	2,231	0.5
VcE	Vaucluse gravelly sandy loam, 15 to 25 percent slopes	546	0.1
VuB	Vaucluse-Urban land complex, 2 to 8 percent slopes	760	0.2
VuD	Vaucluse-Urban land complex, 8 to 15 percent slopes	2,161	0.5
We	Wehadkee loam, 0 to 2 percent slopes, frequently flooded	5,393	1.2
	Water	2,877	0.6
	Total	451,552	100.0

* Less than 0.1 percent.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Tobacco	Soybeans	Tall fescue	Wheat	Grass hay	Grain sorghum
		Bu	Lbs	Bu	AUM*	Bu	Tons	Bu
AeB---------- Ailey	IIIs	60	2,300	20	6.0	30	3.8	36
AeD---------- Ailey	VIs	---	---	---	5.8	---	3.6	---
Bb---------- Bibb	Vw	---	---	---	---	---	3.0	---
CaB---------- Candor	IIIs	45	1,700	18	4.0	30	3.5	28
CaC---------- Candor	IVs	40	1,300	15	4.0	25	3.5	26
CbC**:								
Candor---------	IVs	---	---	---	---	---	---	---
Urban land-----	VIIIs	---	---	---	---	---	---	---
Ch---------- Chewacla	IVw	80	---	30	9.0	---	4.0	40
Co---------- Congaree	IIIw	130	---	40	10.0	---	4.5	65
CrB---------- Creedmoor	IIe	75	2,200	25	5.8	35	4.3	45
CrC---------- Creedmoor	IIIe	60	2,000	22	5.6	30	4.2	40
DoA---------- Dothan	I	110	2,800	35	8.0	50	5.0	62
DoB---------- Dothan	IIe	100	2,700	30	7.8	45	4.8	60
FaB---------- Fuquay	IIs	85	2,400	30	---	---	---	---
FuB**:								
Fuquay---------	IIs	---	---	---	---	---	---	---
Urban land-----	VIIIs	---	---	---	---	---	---	---
GeB---------- Georgeville	IIe	90	2,300	30	7.0	40	4.5	50
GeD---------- Georgeville	IVe	70	2,000	23	6.8	32	4.0	30
GhB---------- Gilead	IIIe	75	2,200	25	5.5	33	3.8	40
GhD---------- Gilead	IVe	70	2,000	22	5.0	30	3.3	38

See footnotes at end of table.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Tobacco	Soybeans	Tall fescue	Wheat	Grass hay	Grain sorghum
		Bu	Lbs	Bu	AUM*	Bu	Tons	Bu
GoC--Goldston	IVs	68	---	22	4.5	35	3.0	36
GoF--Goldston	VIIs	---	---	---	4.0	---	2.5	---
IrB--Iredell	IIe	65	---	22	6.5	35	3.5	35
JoA--Johns	IIw	110	2,700	45	9.0	50	5.0	65
KaA--Kalmia	I	110	2,900	45	9.0	60	4.8	65
KeB--Kenansville	IIs	95	2,800	33	8.0	---	4.5	55
LgB--Lignum	IIe	85	---	32	8.0	50	4.0	45
LgC--Lignum	IIIe	80	---	25	7.8	45	3.8	40
MaB--Masada	IIe	100	2,600	35	8.5	50	4.8	60
MaD--Masada	IIIe	90	2,300	32	8.0	45	4.6	52
MdB--Mayodan	IIe	95	2,300	33	7.0	40	4.5	55
MdD--Mayodan	IVe	80	1,900	25	6.8	35	4.0	40
MdE--Mayodan	VIe	---	---	---	6.0	---	3.5	---
MoB:								
Mooshaunee	IIe	85	2,300	30	7.6	40	4.0	50
Hallison	IIIe	85	2,400	35	7.6	40	4.0	50
MoD:								
Mooshaunee	IIIe	80	2,200	30	7.5	37	3.8	40
Hallison	IVe	80	2,200	30	7.5	36	3.8	40
MoE:								
Mooshaunee	VIe	---	---	---	7.0	---	3.5	---
Hallison	VIe	---	---	---	7.0	---	3.5	---
NaB--Nason	IIe	90	2,200	30	7.0	45	4.5	50
NaD--Nason	IIIe	85	2,000	30	6.8	40	4.0	45

See footnotes at end of table.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Corn	Tobacco	Soybeans	Tall fescue	Wheat	Grass hay	Grain sorghum
		Bu	Lbs	Bu	AUM*	Bu	Tons	Bu
PaA---------- Pactolus	IIIs	65	1,800	25	4.8	40	3.5	30
PkD---------- Pinkston	IVe	65	---	21	4.0	30	3.5	30
PkF---------- Pinkston	VIIe	---	---	---	3.8	---	3.0	---
Pt**---------- Pits	VIIIs	---	---	---	---	---	---	---
TnE:								
Tatum----------	IVe	---	---	---	6.5	---	3.5	---
Nason----------	IVe	---	---	---	6.5	35	3.5	---
ToA---------- Tetotum	IIw	135	2,700	40	8.5	45	5.2	80
Ud---------- Udorthents	VIIIs	---	---	---	---	---	---	---
Ur---------- Urban land	VIIIs	---	---	---	---	---	---	---
VaB---------- Vaucluse	IIIs	65	2,200	22	6.0	35	3.0	36
VaD---------- Vaucluse	IVe	55	2,100	15	5.8	30	2.8	32
VaE---------- Vaucluse	VIe	---	---	---	---	---	2.6	---
VcB---------- Vaucluse	IIIs	60	2,200	23	6.0	33	3.0	35
VcD---------- Vaucluse	IVe	50	1,900	18	5.8	28	2.8	30
VcE---------- Vaucluse	VIe	---	---	---	5.6	---	2.6	---
VuB**:								
Vaucluse-------	IIIs	---	---	---	---	---	---	---
Urban land-----	VIIIs	---	---	---	---	---	---	---
VuD**:								
Vaucluse-------	IVe	---	---	---	---	---	---	---
Urban land-----	VIIIs	---	---	---	---	---	---	---
We---------- Wehadkee	IVw	---	---	---	---	---	---	---

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Ordination symbol	Management concerns			Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	Volume*	
AeB, AeD---------- Ailey	4S	Slight	Moderate	Moderate	Longleaf pine--------	60	56	Longleaf pine, loblolly pine.
					Loblolly pine--------	---	---	
					Blackjack oak--------	---	---	
Bb---------- Bibb	9W	Slight	Severe	Severe	Loblolly pine--------	90	131	Loblolly pine, sweetgum, yellow-poplar.
					Sweetgum----------	90	106	
					Water oak----------	90	86	
					Blackgum----------	---	---	
					Yellow-poplar--------	---	---	
					Atlantic white-cedar-	---	---	
CaB, CaC---------- Candor	4S	Slight	Moderate	Moderate	Longleaf pine--------	58	52	Longleaf pine, loblolly pine.
					Loblolly pine--------	---	---	
					Turkey oak----------	---	---	
					Blackjack oak--------	---	---	
					Post oak----------	---	---	
Ch---------- Chewacla	10W	Slight	Moderate	Slight	Loblolly pine--------	96	145	Loblolly pine, hardwoods.
					Yellow-poplar--------	100	107	
					Sweetgum----------	97	128	
					Water oak----------	86	81	
					Eastern cottonwood---	---	---	
					Green ash----------	---	---	
					Southern red oak-----	---	---	
					Blackgum----------	---	---	
					Red maple----------	---	---	
					Willow oak----------	---	---	
					American beech-------	---	---	
					American sycamore----	---	---	
Co---------- Congaree	9A	Slight	Moderate	Slight	Loblolly pine--------	90	131	Loblolly pine, hardwoods.
					Sweetgum----------	100	138	
					Yellow-poplar--------	107	119	
					Cherrybark oak-------	---	---	
					American sycamore----	89	96	
					Black walnut---------	---	---	
					Scarlet oak----------	100	82	
					Willow oak----------	95	77	
					Green ash----------	---	---	
					American beech-------	---	---	
					Water oak----------	---	---	
CrB, CrC---------- Creedmoor	9A	Slight	Slight	Slight	Loblolly pine--------	87	125	Loblolly pine, hardwoods.
					Yellow-poplar--------	97	102	
					Shortleaf pine-------	---	---	
					Sweetgum----------	---	---	
					Water oak----------	---	---	
					Red maple----------	---	---	
DoA, DoB---------- Dothan	9A	Slight	Slight	Slight	Loblolly pine--------	88	127	Loblolly pine, longleaf pine, hardwoods.
					Longleaf pine--------	84	110	
					Hickory----------	---	---	
					Water oak----------	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Potential productivity: Common trees	Site index	Volume*	Trees to plant
FaB---------- Fuquay	8S	Slight	Moderate	Moderate	Loblolly pine--------	85	120	Loblolly pine, longleaf pine.
					Longleaf pine--------	77	94	
					Blackjack oak--------	---	---	
GeB, GeD---------- Georgeville	8A	Slight	Slight	Slight	Loblolly pine--------	81	112	Loblolly pine, hardwoods.
					Longleaf pine--------	67	72	
					Shortleaf pine-------	63	95	
					White oak----------	69	51	
					Scarlet oak----------	70	52	
					Southern red oak-----	67	49	
					Virginia pine--------	---	---	
					Hickory--------------	---	---	
GhB, GhD---------- Gilead	8A	Slight	Slight	Slight	Loblolly pine--------	84	118	Loblolly pine, hardwoods.
					Longleaf pine--------	70	79	
					Sweetgum-------------	---	---	
					Blackgum-------------	---	---	
					Post oak-------------	---	---	
					Blackjack oak--------	---	---	
					Hickory--------------	---	---	
GoC---------- Goldston	7D	Slight	Slight	Moderate	Loblolly pine--------	76	103	Loblolly pine, hardwoods.
					Shortleaf pine-------	68	106	
					Southern red oak-----	66	48	
					White oak----------	69	51	
					Post oak-------------	---	---	
					Hickory--------------	---	---	
					Virginia pine--------	---	---	
					Red maple------------	---	---	
GoF---------- Goldston	7D	Moderate	Moderate	Moderate	Loblolly pine--------	76	103	Loblolly pine, hardwoods.
					Shortleaf pine-------	68	106	
					Southern red oak-----	66	48	
					White oak----------	69	51	
					Post oak-------------	---	---	
					Hickory--------------	---	---	
					Virginia pine--------	---	---	
					Red maple------------	---	---	
IrB---------- Iredell	6C	Slight	Moderate	Moderate	Loblolly pine--------	67	88	Loblolly pine, hardwoods.
					Shortleaf pine-------	58	84	
					Post oak-------------	44	29	
					White oak----------	47	32	
JoA---------- Johns	9W	Slight	Moderate	Slight	Loblolly pine--------	88	127	Loblolly pine, hardwoods.
					Longleaf pine--------	61	57	
					Sweetgum-------------	---	---	
					Slash pine-----------	---	---	
					Water oak----------	---	---	
					Willow oak-----------	---	---	
					American sycamore----	---	---	
KaA---------- Kalmia	9A	Slight	Slight	Slight	Loblolly pine--------	88	127	Loblolly pine, hardwoods.
					Sweetgum-------------	85	93	
					Yellow-poplar--------	96	100	
					Southern red oak-----	---	---	
					White oak----------	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Potential productivity: Common trees	Site index	Volume*	Trees to plant
KeB Kenansville	8S	Slight	Moderate	Moderate	Loblolly pine Longleaf pine Blackjack oak	84 68 ---	118 74 ---	Loblolly pine, hardwoods.
LgB Lignum	7W	Slight	Slight	Moderate	Loblolly pine Northern red oak Virginia pine Shortleaf pine Southern red oak Red maple Yellow-poplar	76 68 74 66 68 --- ---	103 50 114 101 50 --- ---	Loblolly pine, hardwoods.
LgC Lignum	7W	Moderate	Slight	Moderate	Loblolly pine Northern red oak Virginia pine Shortleaf pine Southern red oak Red maple Yellow-poplar	76 68 74 66 68 --- ---	103 50 114 101 50 --- ---	Loblolly pine, hardwoods.
MaB, MaD Masada	8A	Slight	Slight	Slight	Loblolly pine Southern red oak Virginia pine Shortleaf pine Yellow-poplar Hickory White oak	80 70 70 85 80 --- ---	110 52 109 140 71 --- ---	Loblolly pine, hardwoods.
MdB, MdD Mayodan	9A	Slight	Slight	Slight	Loblolly pine Shortleaf pine Virginia pine White oak Yellow-poplar Sweetgum Southern red oak Black oak Hickory	87 70 60 54 --- --- --- --- ---	125 110 91 38 --- --- --- --- ---	Loblolly pine, hardwoods.
MdE Mayodan	9R	Moderate	Moderate	Slight	Loblolly pine Shortleaf pine White oak Yellow-poplar Sweetgum Southern red oak Hickory	87 70 54 --- --- --- ---	125 110 38 --- --- --- ---	Loblolly pine, hardwoods.
MoB**:								
Mooshaunee	8D	Slight	Slight	Slight	Loblolly pine White oak Southern red oak Shortleaf pine	82 --- --- ---	114 --- --- ---	Loblolly pine, hardwoods.
Hallison	10A	Slight	Moderate	Slight	Loblolly pine White oak Southern red oak Shortleaf pine	93 --- --- ---	138 --- --- ---	Loblolly pine, hardwoods.

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Potential productivity: Common trees	Site index	Volume*	Trees to plant
MoD**:								
Mooshaunee	8D	Moderate	Moderate	Slight	Loblolly pine	82	114	Loblolly pine, hardwoods.
					White oak	---	---	
					Southern red oak	---	---	
					Shortleaf pine	---	---	
Hallison	10A	Slight	Moderate	Slight	Loblolly pine	93	138	Loblolly pine, hardwoods.
					White oak	---	---	
					Southern red oak	---	---	
					Shortleaf pine	---	---	
MoE**:								
Mooshaunee	8R	Moderate	Moderate	Slight	Loblolly pine	82	114	Loblolly pine, hardwoods.
					White oak	---	---	
					Southern red oak	---	---	
					Shortleaf pine	---	---	
Hallison	10R	Moderate	Moderate	Slight	Loblolly pine	93	138	Loblolly pine, hardwoods.
					White oak	---	---	
					Southern red oak	---	---	
					Shortleaf pine	---	---	
NaB, NaD	8A	Slight	Slight	Slight	Loblolly pine	80	110	Loblolly pine, hardwoods.
Nason					Southern red oak	66	48	
					Hickory	---	---	
					Shortleaf pine	66	101	
					White oak	---	---	
					Red maple	---	---	
PaA	9S	Slight	Moderate	Moderate	Loblolly pine	86	123	Loblolly pine, hardwoods.
Pactolus					Sweetgum	---	---	
					Water oak	---	---	
					Willow oak	---	---	
					Red maple	---	---	
PkD	3D	Slight	Slight	Moderate	Southern red oak	60	43	Loblolly pine, hardwoods.
Pinkston					Hickory	---	---	
					Loblolly pine	---	---	
					Shortleaf pine	---	---	
					White oak	---	---	
					American beech	---	---	
PkF	3D	Moderate	Moderate	Moderate	Southern red oak	60	43	Loblolly pine, hardwoods.
Pinkston					Hickory	---	---	
					Loblolly pine	---	---	
					Shortleaf pine	---	---	
					White oak	---	---	
					American beech	---	---	
TnE:								
Tatum	6R	Moderate	Moderate	Moderate	Loblolly pine	68	90	Loblolly pine, hardwoods.
					Shortleaf pine	---	---	
					Yellow-poplar	---	---	
					White oak	55	38	
					Southern red oak	---	---	
					Hickory	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns			Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	Volume*	
TnE:								
Nason	8R	Moderate	Moderate	Slight	Loblolly pine	80	110	Loblolly pine, hardwoods.
					Shortleaf pine	---	---	
					Yellow-poplar	---	---	
					White oak	---	---	
					Southern red oak	---	---	
					Hickory	---	---	
ToA	9W	Slight	Moderate	Slight	Loblolly pine	88	127	Loblolly pine, hardwoods.
Tetotum					Sweetgum	85	93	
					Southern red oak	76	58	
					Yellow-poplar	---	---	
					White oak	---	---	
VaB, VaD	7A	Slight	Slight	Moderate	Loblolly pine	76	103	Loblolly pine, hardwoods.
Vaucluse					Longleaf pine	---	---	
					White oak	---	---	
					Southern red oak	---	---	
VaE	7A	Moderate	Moderate	Moderate	Loblolly pine	76	103	Loblolly pine, hardwoods.
Vaucluse					Longleaf pine	---	---	
					White oak	---	---	
					Southern red oak	---	---	
VcB, VcD	7A	Slight	Slight	Slight	Loblolly pine	76	103	Loblolly pine, hardwoods.
Vaucluse					Shortleaf pine	56	80	
					White oak	---	---	
					Southern red oak	---	---	
VcE	7A	Moderate	Moderate	Slight	Loblolly pine	76	103	Loblolly pine, hardwoods.
Vaucluse					Shortleaf pine	56	80	
					White oak	---	---	
					Southern red oak	---	---	
We	11W	Slight	Severe	Moderate	Loblolly pine	102	159	Loblolly pine, hardwoods.
Wehadkee					Yellow-poplar	100	107	
					Sweetgum	94	119	
					Willow oak	110	110	
					Water oak	91	87	
					Green ash	---	---	
					White ash	---	---	
					American sycamore	---	---	
					River birch	---	---	

* Volume is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AeB Ailey	Moderate: percs slowly, too sandy.	Moderate: percs slowly, too sandy.	Moderate: slope, percs slowly, too sandy.	Moderate: too sandy.	Moderate: droughty.
AeD Ailey	Moderate: slope, percs slowly, too sandy.	Moderate: slope, percs slowly, too sandy.	Severe: slope, too sandy, percs slowly.	Moderate: too sandy.	Moderate: slope, droughty.
Bb Bibb	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding, too sandy.	Severe: wetness, flooding.	Severe: wetness, flooding.
CaB Candor	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
CaC Candor	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
CbC*: Candor	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
Urban land.					
Ch Chewacla	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Co Congaree	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
CrB Creedmoor	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Moderate: wetness.	Moderate: wetness.
CrC Creedmoor	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Moderate: wetness.	Moderate: wetness, slope.
DoA Dothan	Slight	Slight	Slight	Slight	Moderate: droughty.
DoB Dothan	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
FaB Fuquay	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
FuB*:					
Fuquay	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
Urban land.					
GeB---------- Georgeville	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight----------	Moderate: small stones, large stones.
GeD---------- Georgeville	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight----------	Moderate: small stones, large stones.
GhB---------- Gilead	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, percs slowly, wetness.	Moderate: wetness.	Moderate: wetness.
GhD---------- Gilead	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Moderate: wetness.	Moderate: wetness, slope.
GoC---------- Goldston	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: small stones.	Severe: small stones, depth to rock.
GoF---------- Goldston	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones.	Severe: large stones, slope, depth to rock.
IrB---------- Iredell	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
JoA---------- Johns	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
KaA---------- Kalmia	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
KeB---------- Kenansville	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
LgB---------- Lignum	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
LgC---------- Lignum	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: slope, wetness, percs slowly.	Severe: erodes easily.	Moderate: slope, wetness.
MaB---------- Masada	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
MaD Masada	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
MdB Mayodan	Slight	Slight	Moderate: slope.	Slight	Slight.
MdD Mayodan	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
MdE Mayodan	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
MoB*: Mooshaunee	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, depth to rock.	Severe: erodes easily.	Moderate: wetness, depth to rock.
Hallison	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Severe: erodes easily.	Slight.
MoD*: Mooshaunee	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness, slope, depth to rock.
Hallison	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
MoE*: Mooshaunee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Hallison	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
NaB Nason	Slight	Slight	Moderate: slope.	Slight	Slight.
NaD Nason	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
PaA Pactolus	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, droughty, too sandy.
PkD Pinkston	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: droughty, slope, depth to rock.
PkF Pinkston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Pt*. Pits					

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
TnE*:					
Tatum	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Nason	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
ToA	Severe: flooding.	Moderate: wetness.	Moderate: small stones, wetness.	Moderate: wetness.	Moderate: wetness.
Tetotum					
Ud.					
Udorthents					
Ur.					
Urban land					
VaB	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope.	Slight	Moderate: droughty.
Vaucluse					
VaD	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: droughty, slope.
Vaucluse					
VaE	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Vaucluse					
VcB	Severe: small stones.	Moderate: small stones, percs slowly.	Severe: small stones.	Slight	Moderate: small stones, droughty.
Vaucluse					
VcD	Severe: small stones.	Moderate: slope, small stones.	Severe: slope.	Slight	Moderate: small stones, droughty, slope.
Vaucluse					
VcE	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Vaucluse					
VuB*:					
Vaucluse	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope.	Slight	Moderate: droughty.
Urban land.					
VuD*:					
Vaucluse	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: droughty, slope.
Urban land.					
We	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Wehadkee					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--	
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife
AeB---- Ailey	Poor	Poor	Fair	Poor	Poor	Poor	Very poor.	Fair	Poor.
AeD---- Ailey	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor.
Bb---- Bibb	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair.
CaB, CaC---- Candor	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor.
CbC*: Candor.									
Urban land.									
Ch---- Chewacla	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good.
Co---- Congaree	Good	Good	Good	Good	Good	Fair	Fair	Good	Good.
CrB---- Creedmoor	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
CrC---- Creedmoor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good.
DoA, DoB---- Dothan	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good.
FaB---- Fuquay	Fair	Fair	Good	Fair	Fair	Poor	Very poor.	Good	Fair.
FuB*: Fuquay.									
Urban land.									
GeB---- Georgeville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good.
GeD---- Georgeville	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair.
GhB---- Gilead	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
GhD---- Gilead	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good.
GoC---- Goldston	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor.

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--	
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife
GoF---------- Goldston	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor.
IrB---------- Iredell	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good.
JoA---------- Johns	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
KaA---------- Kalmia	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
KeB---------- Kenansville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
LgB---------- Lignum	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
LgC---------- Lignum	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good.
MaB---------- Masada	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
MaD---------- Masada	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good.
MdB---------- Mayodan	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
MdD---------- Mayodan	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good.
MdE---------- Mayodan	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good.
MoB*, MoD*, MoE*: Mooshaunee-------- Hallison----------	Good Good	Good Good	Good Good	Good Good	Good Good	Poor Poor	Very poor. Very poor.	Good Good	Good. Good.
NaB---------- Nason	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
NaD---------- Nason	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good.
PaA---------- Pactolus	Fair	Fair	Good	Good	Good	Poor	Very poor.	Good	Good.
PkD---------- Pinkston	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair.
PkF---------- Pinkston	Very poor.	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair.
Pt*. Pits									

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--	
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife
TnE*:									
Tatum	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good.
Nason	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good.
ToA Tetotum	Good	Good	Good	Good	Good	Poor	Poor	Good	Good.
Ud. Udorthents									
Ur. Urban land									
VaB Vaucluse	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair.
VaD, VaE Vaucluse	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair.
VcB, VcD Vaucluse	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair.
VcE Vaucluse	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair.
VuB*, VuD*:									
Vaucluse.									
Urban land.									
We Wehadkee	Good	Good	Good	Good	Good	Poor	Poor	Good	Good.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AeB--Ailey	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
AeD--Ailey	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope, droughty.
Bb--Bibb	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
CaB--Candor	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
CaC--Candor	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
CbC*: Candor	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Severe: droughty.
Urban land.						
Ch--Chewacla	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
Co--Congaree	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
CrB--Creedmoor	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Moderate: wetness.
CrC--Creedmoor	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: slope.	Severe: shrink-swell, low strength.	Moderate: wetness, slope.
DoA--Dothan	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
DoB--Dothan	Moderate: wetness.	Slight	Moderate: wetness.	Moderate: slope.	Slight	Moderate: droughty.
FaB--Fuquay	Slight	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
FuB*: Fuquay	Slight	Slight	Moderate: wetness.	Moderate: slope.	Slight	Moderate: droughty.
Urban land.						

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
GeB---------- Georgeville	Moderate: too clayey.	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength.	Moderate: small stones, large stones.
GeD---------- Georgeville	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: small stones, large stones.
GhB---------- Gilead	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: low strength, wetness.	Moderate: wetness.
GhD---------- Gilead	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Moderate: low strength, wetness, slope.	Moderate: wetness, slope.
GoC---------- Goldston	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, large stones.	Severe: large stones, depth to rock.
GoF---------- Goldston	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: large stones, slope, depth to rock.
IrB---------- Iredell	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength.	Moderate: wetness.
JoA---------- Johns	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
KaA---------- Kalmia	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
KeB---------- Kenansville	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.
LgB---------- Lignum	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
LgC---------- Lignum	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: slope, wetness.	Severe: low strength.	Moderate: slope, wetness.
MaB---------- Masada	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
MaD---------- Masada	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
MdB---------- Mayodan	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
MdD---------- Mayodan	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
MdE---------- Mayodan	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
MoB*:						
Mooshaunee-------	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.	Moderate: wetness, depth to rock.
Hallison---------	Moderate: wetness.	Slight---------	Moderate: wetness.	Moderate: slope.	Severe: low strength.	Slight.
MoD*:						
Mooshaunee-------	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: wetness, slope, depth to rock.
Hallison---------	Moderate: wetness, slope.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
MoE*:						
Mooshaunee-------	Severe: wetness, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Hallison---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
NaB---------- Nason	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Severe: low strength.	Slight.
NaD---------- Nason	Moderate: slope, too clayey.	Moderate: slope, shrink-swell.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
PaA---------- Pactolus	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty, too sandy.
PkD---------- Pinkston	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.	Moderate: droughty, slope, depth to rock.
PkF---------- Pinkston	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Pt*. Pits						

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
TnE*:						
Tatum	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
Nason	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
ToA	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: low strength, wetness.	Moderate: wetness.
Ud. Udorthents						
Ur. Urban land						
VaB	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
VaD	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
VaE	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
VcB	Moderate: dense layer.	Slight	Slight	Moderate: slope.	Slight	Moderate: small stones, droughty.
VcD	Moderate: dense layer, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, droughty, slope.
VcE	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
VuB*:						
Vaucluse	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Urban land.						
VuD*:						
Vaucluse	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
Urban land.						
We	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding, low strength.	Severe: wetness, flooding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AeB Ailey	Severe: percs slowly.	Severe: seepage.	Slight	Severe: seepage.	Good.
AeD Ailey	Severe: percs slowly.	Severe: seepage, slope.	Moderate: slope.	Severe: seepage.	Fair: slope.
Bb Bibb	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
CaB Candor	Slight	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
CaC Candor	Moderate: slope.	Severe: seepage, slope.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
CbC*: Candor	Slight	Severe: seepage, slope.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Urban land.					
Ch Chewacla	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: hard to pack, wetness.
Co Congaree	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
CrB Creedmoor	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
CrC Creedmoor	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack.
DoA Dothan	Severe: wetness, percs slowly.	Moderate: seepage.	Moderate: wetness.	Slight	Good.
DoB Dothan	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Moderate: wetness.	Slight	Good.
FaB Fuquay	Severe: percs slowly, poor filter.	Severe: seepage.	Moderate: too sandy.	Severe: seepage.	Poor: seepage.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
FuB*: Fuquay	Severe: percs slowly, poor filter.	Severe: seepage.	Moderate: too sandy.	Severe: seepage.	Poor: seepage.
Urban land.					
GeB---- Georgeville	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----	Fair: too clayey, hard to pack.
GeD---- Georgeville	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
GhB---- Gilead	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, hard to pack.
GhD---- Gilead	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Moderate: wetness, slope.	Fair: too clayey, hard to pack, slope.
GoC---- Goldston	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock.	Poor: depth to rock, small stones.
GoF---- Goldston	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
IrB---- Iredell	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
JoA---- Johns	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
KaA---- Kalmia	Slight----	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
KeB---- Kenansville	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness.	Severe: seepage.	Poor: thin layer.
LgB---- Lignum	Severe: percs slowly, wetness.	Moderate: depth to rock, slope.	Severe: depth to rock, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
LgC Lignum	Severe: percs slowly, wetness.	Severe: slope.	Severe: depth to rock, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
MaB Masada	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
MaD Masada	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
MdB Mayodan	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
MdD Mayodan	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
MdE Mayodan	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
MoB*: Mooshaunee	Severe: depth to rock, wetness, percs slowly.	Severe: depth to rock, wetness.	Severe: depth to rock, wetness.	Severe: depth to rock.	Poor: depth to rock.
Hallison	Severe: wetness, percs slowly.	Severe: wetness.	Severe: depth to rock.	Moderate: depth to rock, wetness.	Fair: depth to rock, too clayey.
MoD*: Mooshaunee	Severe: depth to rock, wetness, percs slowly.	Severe: depth to rock, slope, wetness.	Severe: depth to rock, wetness.	Severe: depth to rock.	Poor: depth to rock.
Hallison	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: depth to rock.	Moderate: depth to rock, wetness, slope.	Fair: depth to rock, too clayey, slope.
MoE*: Mooshaunee	Severe: depth to rock, wetness, percs slowly.	Severe: depth to rock, slope, wetness.	Severe: depth to rock, wetness, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Hallison	Severe: wetness, percs slowly, slope.	Severe: slope, wetness.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
NaB Nason	Moderate: depth to rock, percs slowly.	Moderate: slope, seepage, depth to rock.	Severe: too clayey, depth to rock.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
NaD Nason	Moderate: slope, depth to rock, percs slowly.	Severe: slope.	Severe: too clayey, depth to rock.	Moderate: slope, depth to rock.	Poor: too clayey, hard to pack.
PaA Pactolus	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
PkD Pinkston	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
PkF Pinkston	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
Pt*. Pits					
TnE*: Tatum	Severe: slope.	Severe: slope.	Severe: slope, too clayey, depth to rock.	Severe: slope.	Poor: too clayey, hard to pack, small stones.
Nason	Severe: slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: slope, too clayey, hard to pack.
ToA Tetotum	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: too clayey, wetness.
Ud. Udorthents					
Ur. Urban land					
VaB Vaucluse	Severe: percs slowly.	Severe: seepage.	Severe: seepage.	Slight	Fair: too clayey.
VaD Vaucluse	Severe: percs slowly.	Severe: seepage, slope.	Severe: seepage.	Moderate: slope.	Fair: too clayey, slope.
VaE Vaucluse	Severe: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: slope.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
VcB Vaucluse	Severe: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too clayey.
VcD Vaucluse	Severe: percs slowly.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey, slope.
VcE Vaucluse	Severe: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
VuB*: Vaucluse	Severe: percs slowly.	Severe: seepage.	Severe: seepage.	Slight	Fair: too clayey.
Urban land.					
VuD*: Vaucluse	Severe: percs slowly.	Severe: seepage, slope.	Severe: seepage.	Moderate: slope.	Fair: too clayey, slope.
Urban land.					
We Wehadkee	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness, thin layer.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AeB Ailey	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
AeD Ailey	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
Bb Bibb	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, small stones.
CaB, CaC Candor	Good	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
CbC*: Candor	Good	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
Urban land.				
Ch Chewacla	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Co Congaree	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
CrB, CrC Creedmoor	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
DoA, DoB Dothan	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
FaB Fuquay	Good	Improbable: thin layer.	Improbable: too sandy.	Fair: too sandy, small stones.
FuB*: Fuquay	Good	Improbable: thin layer.	Improbable: too sandy.	Fair: too sandy, small stones.
Urban land.				
GeB, GeD Georgeville	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
GhB, GhD Gilead	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
GoC Goldston	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
GoF Goldston	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
IrB Iredell	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
JoA Johns	Fair: wetness.	Probable	Improbable: too sandy.	Fair: thin layer.
KaA Kalmia	Good	Probable	Improbable: too sandy.	Fair: thin layer.
KeB Kenansville	Good	Probable	Improbable: too sandy.	Fair: too sandy.
LgB, LgC Lignum	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
MaB, MaD Masada	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, small stones.
MdB, MdD Mayodan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
MdE Mayodan	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
MoB*: Mooshaunee	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey.
Hallison	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
MoD*: Mooshaunee	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey, slope.
Hallison	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
MoE*: Mooshaunee	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
MoE*:				
Hallison	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
NaB, NaD	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, area reclaim.
Nason				
PaA	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
Pactolus				
PkD	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Pinkston				
PkF	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Pinkston				
Pt*.				
Pits				
TnE*:				
Tatum	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, too clayey, area reclaim.
Nason	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
ToA	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, too clayey.
Tetotum				
Ud.				
Udorthents				
Ur.				
Urban land				
VaB, VaD	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too sandy, small stones.
Vaucluse				
VaE	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too sandy, small stones.
Vaucluse				
VcB, VcD	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Vaucluse				
VcE	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Vaucluse				

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
VuB*, VuD*: Vaucluse	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too sandy, small stones.
Urban land.				
We Wehadkee	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
AeB---------- Ailey	Moderate: seepage, slope.	Slight---------	Deep to water	Droughty, percs slowly, slope.	Too sandy, percs slowly.	Droughty, rooting depth.
AeD---------- Ailey	Severe: slope.	Slight---------	Deep to water	Droughty, percs slowly, slope.	Slope, too sandy, percs slowly.	Slope, droughty, rooting depth.
Bb---------- Bibb	Severe: wetness.	Severe: piping, wetness.	Flooding-------	Wetness--------	Erodes easily, wetness.	Wetness, erodes easily.
CaB---------- Candor	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
CaC---------- Candor	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
CbC*: Candor----------	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
Urban land.						
Ch---------- Chewacla	Moderate: seepage.	Severe: piping, hard to pack, wetness.	Flooding-------	Wetness, flooding.	Wetness--------	Wetness.
Co---------- Congaree	Moderate: seepage.	Severe: piping.	Flooding-------	Wetness--------	Erodes easily, wetness.	Erodes easily.
CrB---------- Creedmoor	Moderate: slope.	Severe: hard to pack.	Percs slowly, slope.	Slope, wetness, soil blowing.	Wetness, soil blowing.	Rooting depth, percs slowly.
CrC---------- Creedmoor	Severe: slope.	Severe: hard to pack.	Percs slowly, slope.	Slope, wetness, soil blowing.	Slope, wetness, soil blowing.	Slope, rooting depth, percs slowly.
DoA---------- Dothan	Moderate: seepage.	Moderate: piping.	Deep to water	Fast intake, droughty.	Favorable------	Droughty.
DoB---------- Dothan	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Fast intake, slope, droughty.	Favorable------	Droughty.
FaB---------- Fuquay	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
FuB*:						
Fuquay	Severe: seepage.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
Urban land.						
GeB---Georgeville	Moderate: seepage, slope.	Severe: hard to pack.	Deep to water	Slope	Favorable	Favorable.
GeD---Georgeville	Severe: slope.	Severe: hard to pack.	Deep to water	Slope	Slope	Slope.
GhB---Gilead	Moderate: slope.	Severe: piping.	Percs slowly, slope.	Slope, wetness, fast intake.	Wetness, soil blowing.	Percs slowly.
GhD---Gilead	Severe: slope.	Severe: piping.	Percs slowly, slope.	Slope, wetness, fast intake.	Slope, wetness, soil blowing.	Slope, percs slowly.
GoC, GoF---Goldston	Severe: depth to rock, slope.	Severe: piping, large stones.	Deep to water	Slope, large stones, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
IrB---Iredell	Moderate: slope.	Severe: hard to pack.	Percs slowly, slope.	Slope, wetness.	Wetness	Wetness, percs slowly.
JoA---Johns	Severe: seepage.	Severe: seepage, piping, wetness.	Cutbanks cave	Wetness, droughty, soil blowing.	Wetness, too sandy, soil blowing.	Droughty.
KaA---Kalmia	Severe: seepage.	Severe: seepage, piping.	Deep to water	Favorable	Too sandy	Favorable.
KeB---Kenansville	Severe: seepage.	Severe: piping.	Deep to water	Fast intake, droughty, soil blowing.	Soil blowing	Droughty.
LgB---Lignum	Moderate: depth to rock, slope.	Moderate: thin layer, hard to pack, wetness.	Slope, percs slowly.	Wetness, percs slowly, slope.	Erodes easily, wetness.	Wetness, erodes easily.
LgC---Lignum	Severe: slope.	Moderate: thin layer, hard to pack, wetness.	Slope, percs slowly.	Wetness, percs slowly, slope.	Slope, erodes easily, wetness.	Wetness, slope, erodes easily.
MaB---Masada	Moderate: seepage, slope.	Moderate: thin layer, hard to pack.	Deep to water	Slope, rooting depth.	Soil blowing	Rooting depth.
MaD---Masada	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Slope, rooting depth.	Slope, soil blowing.	Slope, rooting depth.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
MdB---------- Mayodan	Moderate: seepage, slope.	Severe: hard to pack.	Deep to water	Slope, soil blowing.	Soil blowing---	Favorable.
MdD, MdE---------- Mayodan	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, soil blowing.	Slope, soil blowing.	Slope.
MoB*:						
Mooshaunee-------	Moderate: seepage, depth to rock, slope.	Severe: thin layer.	Depth to rock, slope.	Slope, wetness.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
Hallison---------	Moderate: seepage, depth to rock, slope.	Moderate: thin layer, piping, wetness.	Slope----------	Slope, wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
MoD*, MoE*:						
Mooshaunee-------	Severe: slope.	Severe: thin layer.	Depth to rock, slope.	Slope, wetness.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
Hallison---------	Severe: slope.	Moderate: thin layer, piping, wetness.	Slope----------	Slope, wetness, erodes easily.	Slope, erodes easily, wetness.	Slope, erodes easily.
NaB---------- Nason	Moderate: seepage, depth to rock, slope.	Severe: hard to pack.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
NaD---------- Nason	Severe: slope.	Severe: hard to pack.	Deep to water	Erodes easily, slope.	Slope, erodes easily.	Slope, erodes easily.
PaA---------- Pactolus	Severe: seepage.	Severe: seepage, piping, wetness.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty, rooting depth.
PkD, PkF---------- Pinkston	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, droughty.	Slope, depth to rock, erodes easily.	Slope, erodes easily, droughty.
Pt*. Pits						
TnE*:						
Tatum----------	Severe: slope.	Severe: piping, hard to pack.	Deep to water	Slope----------	Slope----------	Slope.
Nason----------	Severe: slope.	Severe: thin layer.	Deep to water	Slope----------	Slope----------	Slope.
ToA---------- Tetotum	Severe: seepage.	Severe: wetness.	Favorable------	Wetness--------	Wetness, erodes easily.	Erodes easily.
Ud. Udorthents						

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Ur. Urban land						
VaB---------- Vaucluse	Severe: seepage.	Severe: piping.	Deep to water	Slope, droughty, fast intake.	Soil blowing, percs slowly.	Droughty, rooting depth.
VaD, VaE---------- Vaucluse	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, droughty, fast intake.	Slope, soil blowing.	Slope, droughty, rooting depth.
VcB---------- Vaucluse	Severe: seepage.	Moderate: thin layer.	Deep to water	Slope, droughty.	Percs slowly, soil blowing.	Droughty, rooting depth.
VcD, VcE---------- Vaucluse	Severe: seepage, slope.	Moderate: thin layer.	Deep to water	Slope, droughty.	Slope, percs slowly, soil blowing.	Slope, droughty, rooting depth.
VuB*: Vaucluse--------- Urban land.	Severe: seepage.	Severe: piping.	Deep to water	Slope, droughty, fast intake.	Soil blowing, percs slowly.	Droughty, rooting depth.
VuD*: Vaucluse--------- Urban land.	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, droughty, fast intake.	Slope, soil blowing.	Slope, droughty, rooting depth.
We---------- Wehadkee	Moderate: seepage.	Severe: wetness, piping.	Flooding-------	Wetness, soil blowing, flooding.	Wetness, soil blowing.	Wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
AeB----------	0-30	Loamy sand, sand	SM, SP-SM	A-2, A-3	0	85-100	75-100	50-80	5-20	---	NP
Ailey	30-42	Sandy loam, sandy clay loam.	SM, SC, SC-SM	A-2, A-4, A-6	0	90-100	75-100	60-90	30-40	20-40	3-16
	42-50	Sandy loam, sandy clay loam.	SM, SC, SC-SM	A-2, A-4, A-6	0	90-100	75-100	55-90	20-40	20-40	3-15
	50-84	Sandy loam, sandy clay loam.	SM, SC, SC-SM	A-2, A-4, A-6	0	85-100	75-100	50-85	15-40	<40	NP-14
AeD----------	0-30	Loamy sand, sand	SP-SM	A-2, A-3	0	85-100	75-95	50-75	5-12	---	NP
Ailey	30-42	Sandy loam, sandy clay loam.	SM, SC, SC-SM	A-2, A-4, A-6	0	90-100	75-100	60-90	30-40	20-40	3-16
	42-50	Sandy loam, sandy clay loam.	SM, SC, SC-SM	A-2, A-4, A-6	0	90-100	75-100	55-90	20-40	20-40	3-15
	50-84	Sandy loam, sandy clay loam.	SM, SC, SC-SM	A-2, A-4, A-6	0	85-100	75-100	50-85	15-40	<40	NP-14
Bb----------	0-12	Loam----------	ML, CL-ML	A-4	0-5	95-100	90-100	80-90	50-80	<25	NP-7
Bibb	12-70	Sandy loam, loam, fine sandy loam.	SM, SC-SM, ML, CL-ML	A-2, A-4	0-10	60-100	50-100	40-100	30-90	<30	NP-7
CaB, CaC----------	0-26	Sand----------	SM, SP-SM	A-2, A-3, A-2-4	0-2	98-100	96-100	55-90	5-15	---	NP
Candor	26-40	Loamy sand-------	SM, SP-SM	A-2, A-2-4	0-2	98-100	96-100	63-90	10-25	---	NP
	40-66	Sand----------	SM, SP-SM	A-2, A-3	0-7	90-100	90-100	55-90	5-15	---	NP
	66-80	Sandy loam, sandy clay loam.	SC, SC-SM, SM	A-2, A-4, A-6, A-7	0-7	90-100	90-100	55-90	25-49	<45	NP-25
CbC*:											
Candor----------	0-26	Sand----------	SM, SP-SM	A-2, A-3, A-2-4	0-2	98-100	96-100	55-90	5-15	---	NP
	26-40	Loamy sand-------	SM, SP-SM	A-2, A-2-4	0-2	98-100	96-100	63-90	10-25	---	NP
	40-66	Sand----------	SM, SP-SM	A-2, A-3	0-7	90-100	90-100	55-90	5-15	---	NP
	66-80	Sandy loam, sandy clay loam.	SC, SC-SM, SM	A-2, A-4, A-6, A-7	0-7	90-100	90-100	55-90	25-49	<45	NP-25
Urban land.											
Ch----------	0-5	Silt loam--------	ML, CL, CL-ML	A-4, A-6, A-7	0	98-100	95-100	70-100	55-90	25-49	4-20
Chewacla	5-31	Sandy clay loam, loam, sandy loam.	SM, SC-SM, ML, CL	A-4, A-7-6, A-6	0	96-100	95-100	60-100	36-70	20-45	2-15
	31-70	Silt loam, clay loam, silty clay loam.	ML, MH, CL, CH	A-4, A-6, A-7	0	85-100	75-100	60-100	51-98	22-61	4-28
Co----------	0-10	Loam----------	CL-ML, ML, CL	A-4	0	95-100	95-100	70-100	51-90	20-35	3-10
Congaree	10-70	Silty clay loam, fine sandy loam, loam.	SC, ML, CL, SM	A-4, A-6, A-7	0	95-100	95-100	70-100	40-90	25-50	3-22

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
CrB, CrC--------- Creedmoor	0-8	Fine sandy loam	SM, SC-SM	A-4, A-2	0-3	98-100	95-100	70-90	30-49	<25	NP-7
	8-14	Sandy clay loam, clay loam, silty clay loam.	CL	A-7, A-6	0-3	98-100	95-100	85-95	60-80	35-50	20-30
	14-35	Clay, silty clay, sandy clay.	CH	A-7	0-3	98-100	95-100	85-97	70-95	51-79	25-49
	35-83	Sandy loam, sandy clay loam, silty clay loam.	ML, CL-ML, SM, SC	A-7, A-6, A-4	0-5	98-100	95-100	85-98	45-90	25-49	4-21
	83-99	Weathered bedrock	---	---	---	---	---	---	---	---	---
DoA, DoB--------- Dothan	0-11	Loamy sand-------	SM	A-2	0	95-100	92-100	60-80	13-30	---	NP
	11-42	Sandy clay loam, sandy loam, clay loam.	SC-SM, SC, SM	A-2, A-4, A-6	0	95-100	92-100	60-90	23-49	<40	NP-16
	42-84	Sandy clay loam, sandy clay, sandy loam.	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6, A-7	0	95-100	92-100	70-95	30-53	25-45	4-23
FaB-------------- Fuquay	0-28	Loamy sand-------	SP-SM, SM	A-2, A-3	0	95-100	90-100	50-83	5-35	---	NP
	28-40	Sandy loam, fine sandy loam, sandy clay loam.	SM, SC, SC-SM	A-2, A-4, A-6	0	85-100	85-100	70-90	23-45	<45	NP-13
	40-80	Sandy clay loam, clay loam.	SC, SC-SM, SM	A-2, A-4, A-6, A-7-6	0	95-100	90-100	58-90	28-49	25-45	4-13
FuB*: Fuquay---------- Urban land.	0-28	Loamy sand-------	SP-SM, SM	A-2, A-3	0	95-100	90-100	50-83	5-35	---	NP
	28-40	Sandy loam, fine sandy loam, sandy clay loam.	SM, SC, SC-SM	A-2, A-4, A-6	0	85-100	85-100	70-90	23-45	<45	NP-13
	40-80	Sandy clay loam, clay loam.	SC, SC-SM, SM	A-2, A-4, A-6, A-7-6	0	95-100	90-100	58-90	28-49	25-45	4-13
GeB, GeD--------- Georgeville	0-8	Gravelly silt loam.	GM, ML, SM	A-4	0-10	60-80	55-75	45-75	40-70	<40	NP-10
	8-59	Clay, silty clay, silty clay loam.	MH, ML	A-7	0-1	95-100	95-100	90-100	75-98	41-85	15-35
	59-78	Loam, silt loam, very fine sandy loam.	ML, CL, CL-ML	A-4, A-6	0-5	90-100	90-100	65-100	51-95	<30	NP-12
GhB, GhD--------- Gilead	0-8	Loamy sand-------	SP-SM, SM	A-2	0-5	90-100	75-100	55-85	10-35	---	NP
	8-17	Sandy loam, sandy clay loam.	SC-SM, SC	A-2, A-4, A-6	0-5	95-100	70-100	65-95	30-49	<30	4-16
	17-40	Sandy clay, clay loam, clay.	SC, CL, CH, ML	A-6, A-7, A-5, A-4	0-5	95-100	85-100	75-98	45-80	35-70	9-37
	40-80	Sandy loam, sandy clay loam.	SC, CL, CL-ML, SC-SM	A-2, A-6, A-4	0-5	95-100	85-100	70-98	30-60	<32	4-16

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
GoC, GoF--------- Goldston	0-5	Very channery silt loam.	GM, SM, ML	A-2-4, A-4, A-1-b	20-50	40-80	30-80	25-80	20-60	20-40	NP-10
	5-12	Very channery silt loam.	GM, SM, ML	A-2-4, A-4, A-1-b	20-50	40-80	30-80	25-80	20-60	20-40	NP-10
	12-24	Weathered bedrock	---	---	---	---	---	---	---	---	---
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
IrB-------------- Iredell	0-7	Clay loam---------	ML, CL-ML, CL	A-4, A-6	0-1	99-100	95-100	80-95	51-70	25-38	5-12
	7-25	Clay--------------	CH	A-7	0	99-100	60-100	60-100	55-95	54-115	29-85
	25-38	Loam, sandy clay loam, clay loam.	CL, CH, SC	A-7	0-1	98-100	85-100	70-95	40-75	41-60	20-39
	38-62	Variable----------	---	---	---	---	---	---	---	---	---
JoA-------------- Johns	0-7	Fine sandy loam	SM, SC, SC-SM	A-2, A-4	0	100	95-100	70-98	20-49	<30	NP-10
	7-26	Sandy clay loam, sandy loam.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6, A-7	0	100	95-100	60-98	30-65	20-45	5-25
	26-60	Sand, loamy sand	SM, SP-SM, SP	A-2, A-3	0	95-100	95-100	51-90	4-25	---	NP
KaA-------------- Kalmia	0-12	Sandy loam--------	SM, SC, SC-SM	A-2, A-4	0	100	95-100	70-85	20-49	<30	NP-10
	12-37	Sandy clay loam, loam, sandy loam.	SC, SC-SM	A-2, A-4, A-6	0	100	95-100	70-100	30-49	20-35	4-15
	37-60	Loamy sand, sand	SM, SP-SM, SP	A-2, A-3	0	100	95-100	50-70	4-35	---	NP
KeB-------------- Kenansville	0-22	Loamy sand--------	SM, SP-SM	A-1, A-2	0	100	95-100	45-60	10-25	<25	NP-3
	22-36	Sandy loam, sandy clay loam.	SM, SC, SC-SM	A-2, A-4	0	100	95-100	50-75	20-40	<30	NP-10
	36-80	Sand, loamy sand	SP-SM, SM	A-1, A-2, A-3	0	100	95-100	40-60	5-30	---	NP
LgB, LgC--------- Lignum	0-12	Silt loam---------	CL, CL-ML	A-4, A-6	0	95-100	80-100	80-100	55-90	20-35	5-19
	12-39	Silty clay loam, silty clay, clay.	CH, CL	A-7	0-5	80-100	75-100	70-100	55-90	45-70	22-45
	39-56	Silt loam---------	CL, CL-ML	A-4, A-6	0	95-100	80-100	80-100	55-90	20-35	5-19
	56-65	Weathered bedrock	---	---	---	---	---	---	---	---	---
MaB, MaD--------- Masada	0-9	Fine sandy loam	ML, SM, SC, CL	A-4, A-6	0-5	90-100	75-98	60-95	35-75	<30	NP-15
	9-45	Clay loam, clay, gravelly clay.	CH, CL	A-7, A-6	0-10	80-100	70-100	65-95	50-80	35-60	15-35
	45-60	Loam, clay loam, gravelly sandy clay loam.	CL, ML	A-6, A-7, A-4	0-10	80-100	70-100	65-95	50-80	30-45	7-20

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
MdB, MdD, MdE----	0-7	Fine sandy loam	SM, ML	A-2, A-4	0-5	92-100	83-100	49-98	30-70	<36	NP-8
Mayodan	7-14	Silty clay loam, clay loam, sandy clay loam.	CL	A-4, A-6, A-7-6	0-2	95-100	95-100	90-100	50-98	25-50	7-26
	14-51	Clay, silty clay, silty clay loam.	MH, CH, CL, ML	A-7	0-2	95-100	90-100	80-100	50-98	41-80	15-45
	51-99	Weathered bedrock	---	---	---	---	---	---	---	---	---
MoB*, MoD*, MoE*:											
Mooshaunee------	0-10	Silt loam--------	CL, ML, CL-ML	A-4	0-2	98-100	90-100	80-100	51-80	<25	NP-10
	10-37	Silty clay loam, clay loam.	CL	A-4, A-6, A-7	0-2	98-100	90-100	80-100	60-90	22-49	8-30
	37-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Hallison--------	0-11	Silt loam--------	CL, ML, CL-ML	A-4	0-2	98-100	90-100	80-100	51-80	<25	NP-10
	11-41	Silty clay loam, clay loam.	CL	A-4, A-6, A-7	0-2	98-100	90-100	80-100	60-90	22-49	8-30
	41-48	Silty clay loam, clay loam, silt loam.	CL, ML	A-4, A-6, A-7-6	0-2	98-100	90-100	80-100	50-90	22-49	3-30
	48-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
NaB, NaD---------	0-10	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0-5	80-100	75-100	55-95	50-85	15-35	NP-15
Nason	10-37	Silty clay loam, silty clay, clay.	CL, CH	A-7	0-5	80-100	75-100	70-95	65-90	40-60	15-30
	37-47	Silt loam, silty clay loam.	CL-ML, SC, GM-GC, CL	A-2, A-4, A-6	0-5	50-80	45-75	40-75	30-70	20-35	4-12
	47-72	Weathered bedrock	---	---	---	---	---	---	---	---	---
PaA---------------	0-4	Sand-------------	SM, SP-SM	A-2, A-3	0	100	100	51-100	6-30	---	NP
Pactolus	4-80	Sand, loamy sand, loamy fine sand.	SP-SM, SM	A-2, A-3	0	100	100	51-100	5-30	---	NP
PkD, PkF----------	0-6	Silt loam--------	CL, ML, SC-SM	A-4	0-5	80-100	75-100	60-95	45-75	<30	NP-10
Pinkston	6-31	Loam, sandy loam, gravelly silt loam.	SC, CL, ML, SM	A-2, A-4, A-1	0-10	70-100	55-100	35-95	20-75	<30	NP-10
	31-36	Sandy loam, loam, fine sandy loam.	CL, GM, GP-GM, ML	A-1, A-2, A-4, A-6	0-10	40-100	35-85	20-80	10-60	16-35	3-15
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Pt*.											
Pits											
TnE*:											
Tatum-----------	0-5	Channery silt loam.	GM, ML, SM	A-4	0-10	60-80	55-75	45-75	40-70	18-32	NP-10
	5-43	Silty clay loam, silty clay, clay.	MH, GM, SM, GC	A-7	0-10	60-100	55-95	50-95	45-90	50-80	20-45
	43-60	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
TnE*:											
Nason	0-10	Channery silt loam.	SM, GM, ML	A-1, A-2, A-4	0-10	65-85	55-75	40-75	20-70	<38	NP-10
	10-47	Silty clay loam, silty clay, clay.	CL, CH	A-7	0-5	80-100	75-100	70-95	65-90	40-60	15-30
	47-72	Weathered bedrock	---	---	---	---	---	---	---	---	---
ToA	0-9	Silt loam	SM, SC, ML, CL	A-4, A-6	0	85-100	80-100	65-95	45-85	<30	NP-15
Tetotum	9-44	Sandy clay loam, clay loam, silty clay loam.	SC, CL	A-6, A-7	0-2	85-100	80-100	60-95	35-85	30-45	10-20
	44-70	Stratified sandy clay loam to loamy fine sand.	SM, SC, ML, CL	A-2, A-4, A-6	0-2	80-100	75-100	50-95	15-75	<30	NP-15
Ud.											
Udorthents											
Ur.											
Urban land											
VaB, VaD, VaE	0-13	Loamy sand	SM, SP-SM	A-2, A-3	0-5	90-100	90-100	50-75	8-30	---	NP
Vaucluse	13-26	Sandy clay loam, sandy loam.	SC, SC-SM	A-2, A-4, A-6	0-5	90-100	90-100	51-75	25-50	20-40	5-18
	26-50	Sandy clay loam, sandy loam, sandy clay.	SC, SC-SM, SM	A-2, A-4, A-6	0-5	95-100	92-100	51-80	20-50	<40	NP-20
	50-80	Sandy loam, sandy clay loam, loamy sand.	SM, SC, SC-SM	A-2, A-4, A-6	0-2	95-100	95-100	51-90	15-50	<30	NP-12
VcB, VcD, VcE	0-10	Gravelly sandy loam.	SM	A-1, A-2, A-4	2-5	70-90	55-80	40-60	20-45	<30	NP
Vaucluse	10-26	Sandy clay loam, sandy loam.	SC, SC-SM	A-2, A-4, A-6	0-5	90-100	90-100	51-75	25-50	20-40	5-15
	26-46	Sandy clay loam, sandy loam, sandy clay.	SC, SC-SM	A-2, A-4, A-6	0-5	95-100	92-100	55-75	20-50	22-40	4-20
	46-60	Sandy loam, sandy clay loam, sandy clay.	SM, SC, SC-SM	A-2, A-4, A-6	0-5	95-100	95-100	51-90	15-50	<30	NP-12
VuB*, VuD*:											
Vaucluse	0-13	Loamy sand	SM, SP-SM	A-2, A-3	0-5	90-100	90-100	50-75	8-30	---	NP
	13-26	Sandy clay loam, sandy loam.	SC, SC-SM	A-2, A-4, A-6	0-5	90-100	90-100	51-75	25-50	20-40	5-18
	26-50	Sandy clay loam, sandy loam, sandy clay.	SC, SC-SM, SM	A-2, A-4, A-6	0-5	95-100	92-100	51-80	20-50	<40	NP-20
	50-80	Sandy loam, sandy clay loam, loamy sand.	SM, SC, SC-SM	A-2, A-4, A-6	0-2	95-100	95-100	51-90	15-50	<30	NP-12
Urban land.											

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
We---------- Wehadkee	0-6	Loam----------	SM, SC, SC-SM	A-2, A-4	0	100	95-100	60-90	30-50	<30	NP-10
	6-52	Sandy clay loam, clay loam, loam.	CL, CL-ML, ML, SC	A-6, A-7, A-4	0	100	99-100	85-100	45-98	20-58	6-25
	52-62	Variable---------	---	---	---	---	---	---	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
AeB	0-30	5-10	1.35-1.45	6.0-20	0.03-0.05	4.5-6.5	Low	0.15	4	<1
Ailey	30-42	15-35	1.55-1.70	0.6-2.0	0.09-0.12	4.5-5.5	Low	0.24		
	42-50	18-32	1.70-1.80	0.06-0.2	0.06-0.10	4.5-5.5	Low	----		
	50-84	15-30	1.80-1.95	0.06-0.2	0.04-0.08	4.5-5.5	Low	0.15		
AeD	0-30	5-10	1.40-1.55	6.0-20	0.03-0.05	4.5-6.5	Low	0.10	4	<1
Ailey	30-42	15-35	1.55-1.70	0.6-2.0	0.09-0.12	4.5-5.5	Low	0.24		
	42-50	18-32	1.70-1.80	0.06-0.2	0.06-0.10	4.5-5.5	Low	----		
	50-84	15-30	1.80-1.95	0.06-0.2	0.04-0.08	4.5-5.5	Low	0.15		
Bb	0-12	12-27	1.40-1.65	0.6-2.0	0.15-0.20	3.6-5.5	Low	0.28	5	1-3
Bibb	12-70	2-18	1.45-1.75	0.6-2.0	0.10-0.20	3.6-5.5	Low	0.37		
CaB, CaC	0-26	1-10	1.60-1.70	6.0-20	0.02-0.06	3.6-5.5	Low	0.10	5	.5-1
Candor	26-40	6-12	1.55-1.70	6.0-20	0.06-0.10	3.6-5.5	Low	0.10		
	40-66	1-4	1.60-1.70	6.0-20	0.02-0.05	3.6-5.5	Low	0.10		
	66-80	10-35	1.35-1.60	0.6-2.0	0.12-0.16	3.6-5.5	Low	0.20		
CbC*:										
Candor	0-26	1-10	1.60-1.70	6.0-20	0.02-0.06	3.6-5.5	Low	0.10	5	.5-1
	26-40	6-12	1.55-1.70	6.0-20	0.06-0.10	3.6-5.5	Low	0.10		
	40-66	1-4	1.60-1.70	6.0-20	0.02-0.05	3.6-5.5	Low	0.10		
	66-80	10-35	1.35-1.60	0.6-2.0	0.12-0.16	3.6-5.5	Low	0.20		
Urban land.										
Ch	0-5	12-27	1.30-1.60	0.6-2.0	0.15-0.24	4.5-6.5	Low	0.28	5	1-4
Chewacla	5-31	18-35	1.30-1.60	0.6-2.0	0.12-0.20	4.5-6.5	Low	0.28		
	31-70	18-35	1.30-1.50	0.6-2.0	0.15-0.24	4.5-6.5	Low	0.32		
Co	0-10	10-27	1.20-1.40	0.6-2.0	0.12-0.20	4.5-7.3	Low	0.37	5	1-4
Congaree	10-70	18-35	1.20-1.50	0.6-2.0	0.12-0.20	4.5-7.3	Low	0.37		
CrB, CrC	0-8	7-20	1.55-1.70	2.0-6.0	0.10-0.14	3.6-5.5	Low	0.28	3	.5-2
Creedmoor	8-14	20-35	1.45-1.65	0.2-0.6	0.13-0.15	3.6-5.5	Moderate	0.32		
	14-35	35-60	1.30-1.50	<0.06	0.13-0.15	3.6-5.5	High	0.32		
	35-83	5-35	1.60-1.95	<0.06	0.10-0.14	3.6-5.5	Low	0.37		
	83-99	---	---	---	---	---	---	----		
DoA, DoB	0-11	5-15	1.30-1.60	2.0-6.0	0.06-0.10	4.5-6.0	Very low	0.15	5	<.5
Dothan	11-42	18-35	1.40-1.60	0.6-2.0	0.12-0.16	4.5-6.0	Low	0.28		
	42-84	18-40	1.45-1.70	0.2-0.6	0.08-0.12	4.5-6.0	Low	0.28		
FaB	0-28	5-15	1.60-1.70	>6.0	0.04-0.09	4.5-6.0	Low	0.15	5	.5-2
Fuquay	28-40	10-35	1.40-1.60	0.6-2.0	0.12-0.15	4.5-6.0	Low	0.20		
	40-80	20-35	1.40-1.60	0.06-0.2	0.10-0.13	4.5-6.0	Low	0.20		
FuB*:										
Fuquay	0-28	5-15	1.60-1.70	>6.0	0.04-0.09	4.5-6.0	Low	0.15	5	.5-2
	28-40	10-35	1.40-1.60	0.6-2.0	0.12-0.15	4.5-6.0	Low	0.20		
	40-80	20-35	1.40-1.60	0.06-0.2	0.10-0.13	4.5-6.0	Low	0.20		
Urban land.										

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
GeB, GeD--------- Georgeville	0-8 8-59 59-78	12-27 35-65 15-40	1.20-1.40 1.20-1.40 1.20-1.40	0.6-2.0 0.6-2.0 0.6-2.0	0.15-0.20 0.13-0.18 0.05-0.10	4.5-5.5 4.5-5.5 4.5-5.5	Low Low Low	0.24 0.28 0.32	4	.5-2
GhB, GhD--------- Gilead	0-8 8-17 17-40 40-80	5-15 10-35 35-60 10-35	1.50-1.70 1.40-1.60 1.40-1.60 1.50-1.70	2.0-6.0 0.6-2.0 0.06-0.6 0.2-0.6	0.05-0.09 0.10-0.15 0.12-0.16 0.10-0.15	4.5-5.5 4.5-5.5 4.5-5.5 4.5-5.5	Low Low Low Low	0.17 0.24 0.28 0.24	3	.5-1
GoC, GoF--------- Goldston	0-5 5-12 12-24 24	12-27 5-27 --- ---	1.40-1.60 1.40-1.60 --- ---	2.0-6.0 2.0-6.0 --- ---	0.06-0.12 0.06-0.12 --- ---	3.6-5.5 3.6-5.5 --- ---	Low Low --- ---	0.05 0.05 ---- ----	1	.5-2
IrB-------------- Iredell	0-7 7-25 25-38 38-62	27-35 40-60 15-35 ---	1.20-1.40 1.20-1.45 1.30-1.60 ---	0.6-2.0 0.06-0.2 0.06-0.2 ---	0.14-0.17 0.16-0.22 0.14-0.18 ---	5.1-7.3 5.6-7.3 6.1-7.8 ---	Low Very high High ---	0.32 0.20 0.28 ----	3	.5-2
JoA-------------- Johns	0-7 7-26 26-60	10-20 18-35 2-10	1.45-1.65 1.40-1.60 1.60-1.70	2.0-6.0 0.6-2.0 6.0-20	0.10-0.15 0.12-0.15 0.03-0.06	4.5-5.5 4.5-5.5 4.5-5.5	Low Low Low	0.20 0.24 0.10	5	.5-2
KaA-------------- Kalmia	0-12 12-37 37-60	5-20 18-35 2-10	1.45-1.65 1.40-1.60 1.60-1.75	2.0-6.0 0.6-2.0 6.0-20	0.10-0.15 0.12-0.16 0.03-0.06	4.5-5.5 4.5-5.5 4.5-5.5	Low Low Low	0.20 0.24 0.10	5	.5-2
KeB-------------- Kenansville	0-22 22-36 36-80	5-15 5-18 1-10	1.50-1.70 1.30-1.50 1.50-1.70	6.0-20 2.0-6.0 6.0-20	0.04-0.10 0.10-0.15 <0.05	4.5-6.0 4.5-6.0 4.5-6.0	Low Low Low	0.15 0.15 0.10	5	.5-2
LgB, LgC--------- Lignum	0-12 12-39 39-56 56-65	12-27 35-55 12-27 ---	1.20-1.50 1.25-1.55 1.20-1.50 ---	0.6-2.0 <0.06 0.6-2.0 0.0-0.06	0.14-0.20 0.10-0.18 0.14-0.20 ---	4.5-5.5 4.5-5.5 4.5-5.5 ---	Low Moderate Low ---	0.37 0.28 0.37 ----	4	.5-2
MaB, MaD--------- Masada	0-9 9-45 45-60	10-20 27-55 25-40	1.20-1.50 1.30-1.60 1.30-1.60	2.0-6.0 0.6-2.0 0.6-2.0	0.10-0.17 0.10-0.17 0.10-0.17	4.5-5.5 4.5-5.5 4.5-5.5	Low Moderate Moderate	0.32 0.24 0.24	4	1-3
MdB, MdD, MdE---- Mayodan	0-7 7-14 14-51 51-99	10-20 20-40 35-60 ---	1.40-1.65 1.30-1.40 1.25-1.55 ---	2.0-6.0 0.6-2.0 0.6-2.0 ---	0.11-0.17 0.12-0.22 0.12-0.18 ---	4.5-6.0 4.5-6.0 4.5-6.0 ---	Low Low Moderate ---	0.24 0.32 0.28 ----	4	.5-2
MoB*, MoD*, MoE*: Mooshaunee------	0-10 10-37 37-60	12-27 27-35 ---	1.30-1.60 1.30-1.40 ---	0.6-2.0 0.2-2.0 ---	0.14-0.24 0.11-0.18 ---	3.6-5.5 3.6-5.5 ---	Low Low ---	0.37 0.37 ----	2	1-4
Hallison-------- 	0-11 11-41 41-48 48-60	12-27 27-35 18-35 ---	1.30-1.60 1.30-1.40 1.30-1.60 ---	0.6-2.0 0.2-2.0 0.2-2.0 ---	0.15-0.20 0.15-0.20 0.15-0.20 ---	3.6-5.5 3.6-5.5 3.6-5.5 ---	Low Low Low ---	0.37 0.37 0.37 ----	4	1-4
NaB, NaD--------- Nason	0-10 10-37 37-47 47-72	12-27 35-50 10-25 ---	1.25-1.55 1.30-1.60 1.25-1.55 ---	0.6-2.0 0.6-2.0 0.6-2.0 0.0-0.06	0.14-0.20 0.12-0.19 0.15-0.20 ---	4.5-5.5 4.5-5.5 4.5-5.5 ---	Low Moderate Low ---	0.43 0.28 0.28 ----	4	1-3

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
PaA----------	0-4	2-10	1.60-1.75	6.0-20	0.05-0.10	3.6-5.5	Low----------	0.10	5	.5-2
Pactolus	4-80	2-12	1.60-1.75	6.0-20	0.03-0.07	3.6-5.5	Low----------	0.10		
PkD, PkF---------	0-6	12-27	1.20-1.40	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.37	2	.5-2
Pinkston	6-31	10-18	1.20-1.50	2.0-6.0	0.06-0.18	4.5-5.5	Low----------	0.24		
	31-36	10-20	1.20-1.50	2.0-6.0	0.05-0.16	4.5-5.5	Low----------	0.24		
	36	---	---	0.2-0.6	---	---	----------	----		
Pt*.										
Pits										
TnE*:										
Tatum----------	0-5	12-27	1.10-1.40	0.6-2.0	0.10-0.17	4.5-5.5	Low----------	0.20	4	.5-2
	5-43	45-60	1.40-1.45	0.6-2.0	0.08-0.12	4.5-5.5	Moderate-----	0.28		
	43-60	---	---	0.0-0.06	---	---	----------	----		
Nason----------	0-10	12-27	1.35-1.45	0.6-2.0	0.14-0.20	4.5-5.5	Low----------	0.24	4	2-5
	10-47	28-53	1.40-1.50	0.6-2.0	0.12-0.19	4.5-5.5	Moderate-----	0.32		
	47-72	---	---	0.0-0.06	---	---	----------	----		
ToA----------	0-9	12-27	1.40-1.65	0.6-2.0	0.14-0.19	3.6-5.5	Low----------	0.37	4	.5-2
Tetotum	9-44	18-35	1.40-1.65	0.6-2.0	0.14-0.19	3.6-5.5	Low----------	0.32		
	44-70	5-30	1.50-1.80	0.6-20	0.08-0.12	3.6-5.5	Low----------	0.32		
Ud.										
Udorthents										
Ur.										
Urban land										
VaB, VaD, VaE----	0-13	5-15	1.30-1.60	6.0-20	0.04-0.08	4.5-5.5	Low----------	0.15	3	<1
Vaucluse	13-26	18-35	1.35-1.75	0.6-2.0	0.10-0.15	3.6-5.5	Low----------	0.24		
	26-50	18-45	1.75-1.95	0.06-0.6	0.04-0.08	3.6-5.5	Low----------	0.24		
	50-80	5-30	1.55-1.90	2.0-6.0	0.04-0.08	3.6-5.5	Low----------	0.17		
VcB, VcD, VcE----	0-10	10-20	1.30-1.60	2.0-6.0	0.06-0.10	4.5-5.5	Low----------	0.15	3	<2
Vaucluse	10-26	18-35	1.35-1.75	0.6-6.0	0.10-0.15	4.5-5.5	Low----------	0.24		
	26-46	18-45	1.75-1.95	0.06-0.6	0.04-0.08	3.6-5.5	Low----------	0.24		
	46-60	5-30	1.55-1.90	2.0-6.0	0.04-0.08	3.6-5.5	Low----------	0.17		
VuB*, VuD*:										
Vaucluse--------	0-13	5-15	1.30-1.60	6.0-20	0.04-0.08	4.5-5.5	Low----------	0.15	3	<1
	13-26	18-35	1.35-1.75	0.6-2.0	0.10-0.15	3.6-5.5	Low----------	0.24		
	26-50	18-45	1.75-1.95	0.06-0.6	0.04-0.08	3.6-5.5	Low----------	0.24		
	50-80	5-30	1.55-1.90	2.0-6.0	0.04-0.08	3.6-5.5	Low----------	0.17		
Urban land.										
We----------	0-6	10-27	1.35-1.60	2.0-6.0	0.10-0.15	4.5-6.5	Low----------	0.24	5	2-5
Wehadkee	6-52	18-35	1.30-1.50	0.6-2.0	0.16-0.20	4.5-6.5	Low----------	0.32		
	52-62	---	---	---	---	---	----------	----		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
AeB, AeD---------- Ailey	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Bb---------- Bibb	D	Frequent----	Brief to long.	Dec-May	0.5-1.0	Apparent	Dec-Apr	>60	---	High-----	Moderate.
CaB, CaC---------- Candor	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Low.
CbC*:											
Candor----------	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Low.
Urban land.											
Ch---------- Chewacla	C	Frequent----	Brief to long.	Nov-Apr	0.5-1.5	Apparent	Nov-Apr	>60	---	High-----	Moderate.
Co---------- Congaree	B	Frequent----	Brief-----	Nov-Apr	2.5-4.0	Apparent	Nov-Apr	>60	---	Moderate	Moderate.
CrB, CrC---------- Creedmoor	C	None--------	---	---	1.5-2.0	Perched	Jan-Mar	>60	---	High-----	High.
DoA, DoB---------- Dothan	B	None--------	---	---	3.0-5.0	Perched	Jan-Apr	>60	---	Moderate	Moderate.
FaB---------- Fuquay	B	None--------	---	---	4.0-6.0	Perched	Jan-Mar	>60	---	Low------	High.
FuB*:											
Fuquay----------	B	None--------	---	---	4.0-6.0	Perched	Jan-Mar	>60	---	Low------	High.
Urban land.											
GeB, GeD---------- Georgeville	B	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
GhB, GhD---------- Gilead	C	None--------	---	---	1.5-2.5	Perched	Jan-Mar	>60	---	Moderate	High.
GoC, GoF---------- Goldston	C	None--------	---	---	>6.0	---	---	10-20	Soft	Moderate	High.
IrB---------- Iredell	C/D	None--------	---	---	1.0-2.0	Perched	Dec-Apr	>60	---	High-----	Low.
JoA---------- Johns	C	None--------	---	---	1.5-3.0	Apparent	Dec-Apr	>60	---	Moderate	High.
KaA---------- Kalmia	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
KeB---------- Kenansville	A	None--------	---	---	4.0-6.0	Apparent	Dec-Apr	>60	---	Low------	High.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
LgB, LgC---------- Lignum	C	None--------	---	---	1.0-2.5	Perched	Dec-May	40-60	Soft	High-----	High.
MaB, MaD---------- Masada	C	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
MdB, MdD, MdE----- Mayodan	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Moderate.
MoB*, MoD*, MoE*:											
Mooshaunee-------	C	None--------	---	---	1.5-3.0	Perched	Jan-Apr	20-40	Soft	Moderate	High.
Hallison---------	C	None--------	---	---	2.5-4.0	Perched	Jan-Apr	40-60	Soft	Moderate	High.
NaB, NaD---------- Nason	C	None--------	---	---	>6.0	---	---	40-60	Soft	Moderate	High.
PaA---------- Pactolus	A	None--------	---	---	1.5-3.0	Apparent	Dec-Apr	>60	---	Low------	High.
PkD, PkF---------- Pinkston	B	None--------	---	---	>6.0	---	---	20-40	Hard	Low------	High.
Pt*. Pits											
TnE*:											
Tatum------------	B	None--------	---	---	>6.0	---	---	40-60	Soft	High-----	High.
Nason------------	B	None--------	---	---	>6.0	---	---	40-60	Soft	Moderate	High.
ToA---------- Tetotum	C	Rare--------	Brief-----	---	1.5-2.5	Apparent	Dec-Apr	>60	---	High-----	High.
Ud. Udorthents											
Ur. Urban land											
VaB, VaD, VaE, VcB, VcD, VcE---- Vaucluse	C	None--------	---	---	>6.0	---	---	>60	---	Low------	High.
VuB*, VuD*:											
Vaucluse---------	C	None--------	---	---	>6.0	---	---	>60	---	Low------	High.
Urban land.											
We---------- Wehadkee	D	Frequent----	Brief to long.	Nov-Jun	0-1.0	Apparent	Nov-May	>60	---	High-----	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Ailey	Loamy, siliceous, thermic Arenic Kanhapludults
*Bibb	Coarse-loamy, siliceous, acid, thermic Typic Fluvaquents
Candor	Sandy, siliceous, thermic Arenic Paleudults
Chewacla	Fine-loamy, mixed, thermic Fluvaquentic Dystrochrepts
Congaree	Fine-loamy, mixed, nonacid, thermic Typic Udifluvents
Creedmoor	Clayey, mixed, thermic Aquic Hapludults
Dothan	Fine-loamy, siliceous, thermic Plinthic Kandiudults
Fuquay	Loamy, siliceous, thermic Arenic Plinthic Kandiudults
Georgeville	Clayey, kaolinitic, thermic Typic Hapludults
Gilead	Clayey, kaolinitic, thermic Aquic Hapludults
Goldston	Loamy-skeletal, siliceous, thermic, shallow Typic Dystrochrepts
Hallison	Fine-silty, mixed, thermic Typic Hapludults
Iredell	Fine, montmorillonitic, thermic Typic Hapludalfs
Johns	Fine-loamy over sandy or sandy-skeletal, siliceous, thermic Aquic Hapludults
Kalmia	Fine-loamy over sandy or sandy-skeletal, siliceous, thermic Typic Hapludults
Kenansville	Loamy, siliceous, thermic Arenic Hapludults
Lignum	Clayey, mixed, thermic Aquic Hapludults
Masada	Clayey, mixed, thermic Typic Hapludults
Mayodan	Clayey, mixed, thermic Typic Hapludults
Mooshaunee	Fine-silty, mixed, thermic Aquic Hapludults
Nason	Clayey, mixed, thermic Typic Hapludults
Pactolus	Thermic, coated Aquic Quartzipsamments
Pinkston	Coarse-loamy, mixed, thermic Ruptic-Ultic Dystrochrepts
Tatum	Clayey, mixed, thermic Typic Hapludults
Tetotum	Fine-loamy, mixed, thermic Aquic Hapludults
Udorthents	Udorthents
Vaucluse	Fine-loamy, siliceous, thermic Typic Kanhapludults
Wehadkee	Fine-loamy, mixed, nonacid, thermic Typic Fluvaquents

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